

COMPUTERWORLD

Developer's exit could further slow Repository

Users skeptical that IBM can fill key CASE holes

BY JOHANNA AMBROSIO
CW STAFF

SAN JOSE, Calif. — IBM's beleaguered Repository Manager blueprint has suffered another setback with the resignation of one of the project's key technical development managers.

Steve Uhlar, manager of Repository development, will officially leave IBM tomorrow, a spokesman confirmed. Uhlar was one of five Repository development managers working out of IBM's Santa Teresa, Calif., laboratory. He had some 70 technical staff members reporting to him.

Uhlar is reportedly jumping to a software development position at Sun Microsystems Inc. He did not return telephone calls by press time.

The resignation is yet another indication of the technical and political problems that have plagued the development of Re-

pository Manager since its 1989 announcement, some analysts and users said. It is the cornerstone of IBM's computer-aided software engineering strategy known as AD/Cycle. When completed, AD/Cycle will allow users to mix and match software development tools from different vendors.

Despite Uhlar's departure, executives at IBM and the third parties helping to bring the projec-

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T he flood of red ink flowing from IBM and Digital Equipment Corp. is just one more sign that users are scaling back on large-system purchases in favor of desktop-centric strategies. But while IBM stands as a grizzled veteran of the personal computer wars, DEC is merely a scarred bystander.

A newly reorganized IBM may find some relief in the PC market, but analysts said it is unlikely that DEC will enjoy the same — despite a belated and renewed interest in the Intel Corp.-based desktop.

David Wu, a computer analyst at S.G. Warburg & Co. in New York, said DEC's financial recovery cannot hinge on its entry into the PC market. "Opportunities [here] are too small, and the profit margin is too little, even though PC networking is

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LAN
manager
matchup



User satisfaction increased with HP's OpenView and IBM's NetView capabilities to manage LANs, but it declined for Sun Microsystems' SunNet Manager.

See Buyers' Scorecard, page 96

| Product | Score |
|------------------------|---------|
| HP's OpenView | 69 71 |
| Sun's SunNet Manager | 69 64 |
| IBM's NetView | 59 61 |
| Average | 66 65 |
| Highest possible score | 100 100 |

Mass. Blue Cross tries EDS Rx

BY NELL MARGOLIS
CW STAFF

BOSTON — Electronic Data Systems Corp. last week landed the biggest health insurance outsourcing deal ever — a 10-year, \$800 million-plus contract from technologically ailing Blue Cross/Blue Shield of Massachusetts.

The pact strongly positions EDS to bid for major player status should a national health care program be implemented.

The contract puts the Dallas-based outsourcing player in charge of Blue Cross' multivendor data center and communica-

Outsourcing elixir?

The \$800M Blue Cross/Blue Shield deal requires EDS to:

- ▶ Run data center and manage telecommunications network.
- ▶ Share applications development following in-house automation fiasco.
- ▶ Boost competitiveness through cost reduction and operational efficiencies.

tions network. In a striking departure from traditional facilities management deals, however, the contract also makes the two organizations full partners in ap-

plications development.

"We're trying to migrate quickly from the traditional health insurance-provider mode to being a world-class provider of total health care management," noted Martin C. Joyce Jr., senior vice president of operations at Blue Cross. Tapping into EDS' well-established technological stronghold, he said, will be key to bridging the gap.

Playing critical role

"This is a bellwether contract," said Alice Lutz, president of EDS' Health and Benefits strategic business unit. Blue Cross "truly believes that technology has an integral and critical role in health care."

The depth of the development partnership is not the only innovative element of last week's deal. The firms are also blazing a trail on the administrative side. A new Office of the

Continued on page 131

DEC'S TROJAN HORSE

Systems integration key to PC strategy

BY SALLY CUSACK
CW STAFF

T he flood of red ink flowing from IBM and Digital Equipment Corp. is just one more sign that users are scaling back on large-system purchases in favor of desktop-centric strategies. But while IBM stands as a grizzled veteran of the personal computer wars, DEC is merely a scarred bystander.

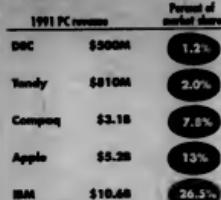
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Outside looking in

DEC's PC share is dwarfed by competitors



(Total market: \$40B)

Source: Gartner Group, Inc. CW Chart: Jason Grossman

Borland, Microsoft to take on Lotus Notes

BY ROSEMARY HAMILTON
CW STAFF

Although Lotus Development Corp. holds a substantial lead in groupware, it could soon find itself dogged by its traditional — as well as more aggressive — competitors.

Today, Microsoft Corp. and Borland International, Inc. are betting Lotus primarily with words, but they are suggesting that will soon change.

Executives at both companies indicated that the two are plotting to grab chunks of the market by positioning Lotus Notes as a proprietary environment and establishing their own "open" solutions as another approach to work-group computing. The goal would appeal to users who are not necessarily sold on the Notes approach.

That will not be easy because Notes is gaining momentum, and Lotus holds significant "mind

share" in the groupware market, observers said. Lotus has installed about 90,000 Notes licenses since shipping the product in 1989, and a big piece of its business has come in the last 12 months. As of February 1991, the company had sold 35,000 licenses.

Still, several users contacted said they had only begun to explore the groupware concept and will not make production decisions for some time. "I'd like for someone to come out with an alternative" to Notes, said Joseph Herrin, director of systems development at Joseph

INSIDE

Sun CEO
Scott McNealy took some shots at a prominent alliance at Uniform. Page 132.



IS management is hit hard by cutbacks at United Technologies. Page 7.

Entry-level additions to DEC's midrange line could help the company fend off IBM's AS/400. Page 16.

Product Spotlight — Do you know what's on your LAN? New tools can tell you. Page 91.

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- 8 IBM slides AIX Netview/6000 into the market to create order out of router chaos.

10 Motorola casts its wireless network and hauls in Racotech to market the young company's trunked radio systems.

12 The fate of taxes on mail-order PCs and workstations is being decided by the Supreme Court in the case of an Illinois catalog vendor, v. the state of North Dakota.

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I BM has "cried Repository development spurs another round of nagging questions about the oft-touted, still elusive blueprint's technological heft and third-party support and raises the specter of lost momentum. Page 1.

IRA MORROW
SENIOR WRITER

On the docket during the project. See story page 1.

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EXECUTIVE BRIEFING

■ The departure of IBM's manager of Repository development spurs another round of nagging questions about the oft-touted, still elusive blueprint's technological heft and third-party support and raises the specter of lost momentum. Page 1.

■ Comprehensive local-area network management is more than monitoring hardware and analyzing protocols. There is a slew of day-to-day management tasks that third-party developers are just beginning to address, such as documenting what is on the LAN, backing up and restoring data, monitoring server capacity, preventing viruses and metering software licenses, among others. Page 91.

■ Microsoft and Borland are poised to move into the groupware market before the year is out, and some users welcome the prospect of alternatives to Lotus' Notes offering. But analysts say raising the number of players to 1-2-3 is unlikely to dislodge Lotus from the top slot. Page 1.

■ A new world of wireless data communications may be on the horizon. A string of product announcements, including some scheduled for this week's Comdex show, and a recent Federal Communications Commission decision to open up the airwaves for more emerging technologies are generating interest in areas such as mobile data communications. Pages 67 and 69.

■ Massachusetts' largest health care insurer hands over its fledgling information systems operations to Electronic Data Systems in an \$800 million outsourcing deal. Page 1.

■ Hewlett-Packard did more than bring out a few hot new workstations earlier this month. The company gave a boost to the X Window System. Page 51.

■ Acrimony between information systems folks and users can undermine a company's business objectives. Try putting the relationship to a test — literally. Through a quiz devised by an IS professional at 3M, IS managers can gauge the level of misunderstanding between the two groups. The results can be used in a joint problem-solving session that could be the key to harmonious coexistence. Page 103.

■ Once more, DEC is setting out for the desktop.

This time, the company is betting on its role as a systems integrator to make it a personal computer player. Page 1.

■ Feeling secure with the niche it has carved for its automated tape library in the IBM mainframe world, Storage Tek hopes it can find new markets for the robotic tape cartridge system. Page 29.

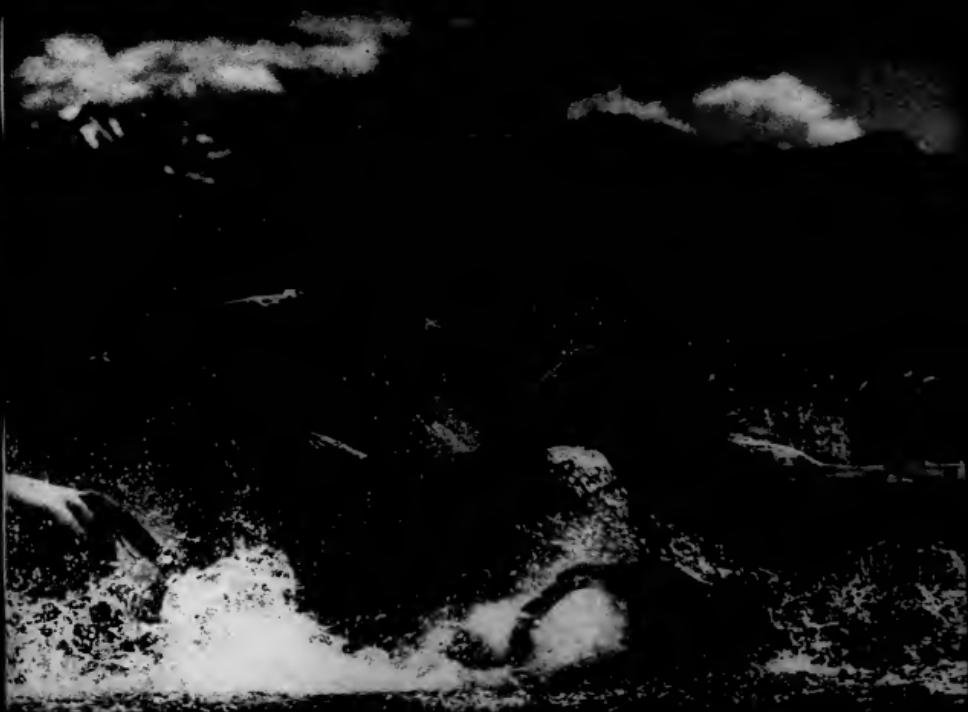
■ Can Unix win respect in the commercial world? That question loomed large at last week's Unixfest, where some 40,000 attendees also focused on ease of use, scalability, interoperability and security issues. Page 132.

■ It's a tough time in retail. IS executives throughout the retail sector gathered recently to find ways to use technology for greater profitability. Meanwhile, specialty retailer Brookstone made a concession to the times by eliminating in-house programming in favor of commercial software, and cut its development staff in half. Pages 33 and 77.

■ On site this week: T-1-tell it to the judge is the word in Los Angeles, where a video image — without the Max Headroom stature — in a kiosk will be adjudicating traffic and parking ticket cases. Page 53. Pizza Hut has been working to cut down on paper and improve efficiency by drawing some suppliers into electronic data interchange partnerships and using an imaging system to process paperwork from its other vendors. Page 67. Held up as a model for federal agencies, MCI Communications emphasizes the "planning" when it comes to capacity planning for its data centers. Page 31.

The 5th Wave





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NT developers breeze through code porting

BY JAMES DALLY
CW STAFF

Developers are reporting smooth sailing in their early efforts to port applications over to the still-developing Windows New Technology (NT) operating system, a 32-bit version of Microsoft Corp.'s Windows that is expected to go into beta testing by midyear and ship in early 1993.

"If you're porting GUI code, it's a piece of cake," said Tim Farrell, president of Microsoft Engineering, Inc., in Houston. Farrell and his engineers ported a Windows 3.0-based 3270 emulation package to NT in less than a week.

Although actual Windows NT applications are still largely a twinkle in developers' eyes, the bedrock code for the final version of Windows NT has stabilized enough in the past six months to allow developers to create solid prototypes.

Microsoft Vice President Paul Maritz will give further briefings on the state of Windows NT at the Windows & OS/2 Conference tomorrow in San

Jose, Calif.

Microsoft hopes to have 50 Windows NT applications by April's Comdex/Spring '92, according to Jesse Berst, publisher of the "Windows Watcher" newsletter. NT Version 1.0 will ship by year's end with built-in peer-to-peer networking called Windows Server. The NT team is reportedly talking to third-party utility makers to bundle Norton-style utilities with the new product, he added.

Reason for ease

What sets much of the coding work required by many developers aside, was the remarkable similarity between the Windows NT and Windows 3.0 application programming interfaces.

"Microsoft seems to have learned from its OS/2 experience, and I don't think they'll ever downplay the issue of compatibility again," said Andrew Singer, president of Enginuity, Inc., in Palo Alto, Calif.

"On the surface, users aren't going to see a whole heck of a lot of difference between Windows NT and Windows 3.0, except Windows NT is a lot more pow-

erful and flexible," said Ray Ozer, president of Iris Associates, Inc. in Westford, Mass. His firm is crafting a version of Lotus Development Corp.'s Notes for Windows NT.

One complaint, however, is that Windows NT will require at least 8M bytes of random-access memory. "It's not for the meek," one developer said.

Part of Microsoft's early success in the development of Windows NT can be attributed to its Open Process forum, which brings developers into the design schedule up to 18 months earlier than in previous operating system development cycles [CW, Jan. 20].

In these meetings, Microsoft technical personnel present preliminary designs for Windows NT to independent hardware and software vendors. The third-party vendors may in turn present alternative approaches to the updated operating system.

Microsoft officials said they hope the added input will result in more tightly integrated applications and avert the persistent program crashes that aggravated early users of Windows 3.0.

Developers are highly enthused about their newfound ability for early input. "Everyone benefits from developers having as much feedback as possible in the design loop," Oznic said.

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IBM to pump up midrange PC line

BY CAROL HILDEBRAND
CW STAFF

WHITE PLAINS, N.Y. — The first IBM desktop rollout since its grand personal computer reorganization is slated for next month in the form of several midrange boxes based on IBM's RISC processor, the 386SLC chip, according to sources close to the company.

The addition is set for Feb. 25, unveiled, will beef up the company's midrange PC line, including a 16-MHz 386SX-based model, and replace the all-time best-seller Model 555X.

At 2½ years old, it is one of the older stalwarts of the Personal System/2 line. Eventually, the newcomers will also bump out the PS/2 Model 70, sources said. IBM will offer three upgrade choices: a 20-MHz 386SX-based Model 56 with an upgrade option to IBM's SLC chip, an SLC-based Model 56 and a new Model 57, also with the SLC processor on the motherboard.

The Model 56 can be configured with 4M to 16M bytes of random-access memory and 80M- to 160M-byte hard drives. Also standard are Extended Graphics Array, a three-bay, two-slot configuration and the ability to accept 2.88M-byte floppy disks.

The Model 57 comes similarly featured, but with more expansion capabilities in its four-bay, five-slot configuration. Pricing for the Model 56 will be in line with current Model 555X pricing, around \$2,745 for a model with a 40M-byte drive. Model 57 will run slightly higher.

er, according to sources.

Noted John Dunkle, an analyst at Workgroup Technologies, Inc., in Hampton, N.H. "By bolstering the midrange, IBM is giving [Model 55] users follow-on choices. They're extremely conscious that users want to buy the 386 architecture at a price/performance-oriented level."

The SLC processor, developed by IBM, lets cache directly on the chip to boost 386SX performance close to the level of a 33-MHz 386DX chip.

European simultaneous
The Model 56 has been available on a limited basis in Europe, sources said, but a similar overseas announcement is slated for the same day as the U.S. debut, sources said.

Eventually, the new models reportedly will be sold through such alternative distribution as catalog sales and telemarketing. Winnie Briney, vice president of personal systems marketing, acknowledged that IBM is aggressively looking at both methods of distribution.

While the PS/2 reportedly will be preconfigured with OS/2, Briney said the new models "will not be bundled with OS/2 in this [first-quarter] time frame."

Analysts were cautious. "That segment is a commodity market, where IBM has typically been a little behind in price/performance. They needed to tactically adjust the line and inject a little performance, and this will help," said Bruce Stephen, a PC analyst at International Data Corp.

Compaq squeezes notebook PC prices

BY MICHAEL FITZGERALD
CW STAFF

HOUSTON — Compaq Computer Corp. said it will unveil today a pair of high-performance notebook computers priced well below its traditional premium. Compaq users were impressed, but analysts said the computer maker will face some sticky times as it sheds its old skin.

Compaq's LTE Lite 386/20 and Lite 386/25 are based on Intel Corp.'s 20-MHz and 25-MHz 80386SX power management chips, respectively. Both machines have custom power features that offer up to 45 hours of use, more readable displays than the existing LTE 386S/20 and cursor keys formed in an inverted "T" shape, which address a major annoyance for Compaq customers.

A Johnson & Johnson subsidiary in Raritan, N.J., waited to start a notebook upgrade of its field sales force until it saw the new Compaq products, and the firm said it was worth the wait.

"We let them know what we liked and didn't like about the LTE 386S/20, and this system meets our requirements," said Carol Norria, information services consultant at Johnson & Johnson subsidiary Ortho Pharmaceutical Corp. She cited lower weight, longer battery life, Com-



Compaq's new LTE Lites are desktop expanders station that also supports the LTE 386S/20

paq's software utilities and the inverted T on the keyboard as specific improvements. Analysts said the new products show a marked improvement in Compaq's approach to the market.

Compaq is showing two changes in strategy: underpricing Dell and the other second-tier clone vendors and being much more aggressive in getting products out faster. The question is, with this pricing, can they support their cost structures? asked George F. Colony, president of Forrester Research, Inc.

The LTE Lite 386/20 will

come with 2M bytes of random-access memory, expandable to 10M bytes, and 40M-byte, 60M-byte and 84M-byte hard-drive configurations. Pricing will range from \$2,899 to \$3,599.

The LTE Lite 386/25 has 4M bytes of RAM, expandable to 10M bytes, and comes configured in 60M-, 84M- and 120M-byte fixed-disk versions, priced from \$3,699 to \$4,699. Both systems claim up to 4½ hours in battery life, though the 386/20 has a Nicad battery, while the 386/25 comes with a nickel-metal-hydride battery.

Compaq, SGI call it quits

BY CAROL HILDEBRAND
CW STAFF

The bloom is off an April rose following the dissolution of a 9-month-old technology development agreement between Compaq Computer Corp. and Silicon Graphics, Inc.

Last week, the companies announced the end of their deal to co-develop machines based on Mips Computer Systems, Inc.'s reduced instruction set computing architecture because of differences in strategies. However, they will continue to have access to technologies developed prior to the agreement's end.

Compaq also ended its investment in the Mountain View, Calif.-based workstation maker. Under terms of the restructuring, Compaq will pay \$3.75 million to Silicon Graphics this month, and Silicon Graphics will

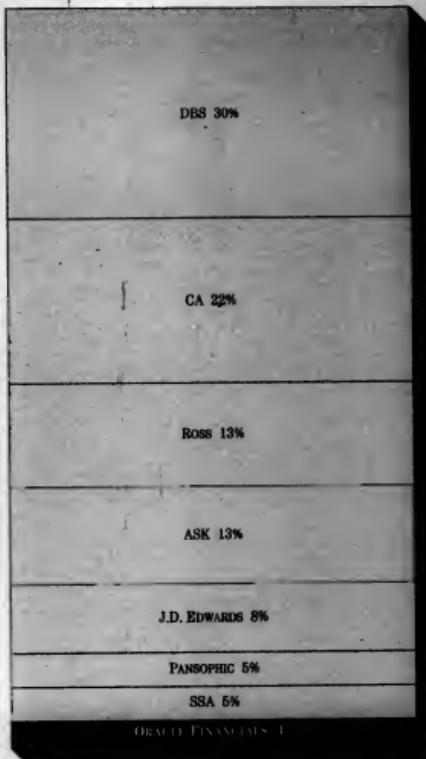
repurchase the stock bought by Compaq, which totals approximately \$150 million.

Silicon Graphics' recent turmoil following the ouster of co-founder Rod Canion had its effect on the agreement, Compaq spokesman Bob Beach acknowledged.

Also, "it became apparent that the more we worked together, the more we found that we really do have very different strategies," he added.

Beach denied that this signaled an end to Compaq's work with the Advanced Computing Environment (ACE) consortium, adding that Silicon Graphics' highly sophisticated workstations were beyond the needs of the commercial market Compaq is focused on. Cost competitiveness and time to market were two other underlying factors, he said.

THE FINANCIAL SOFTWARE MARKET HAS JUST BEEN TURNED UPSIDE DOWN.

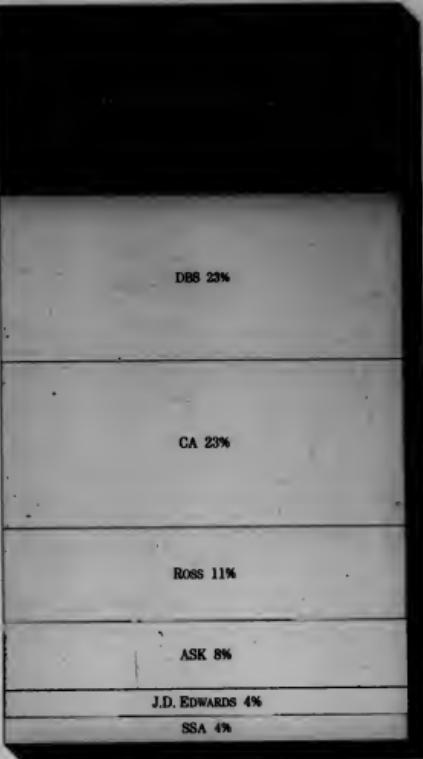


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NEWS SHORTS

Win some . . .

Data General Corp. started fiscal 1992 in the black, barely. DG reported last week a net income of \$4 million for 1992's fiscal first quarter, down 58% from \$12.4 million in first-quarter 1991. Sales fell more than 5% compared with last year, from \$311.7 million to \$294.8 million. The company blamed the drop partly on the loss of Japanese revenue, because of the sale last year of its Nippon Data General subsidiary. However, this was its fifth straight profitable quarter after 2½ years of losses, thanks to the increasing popularity of DG's Unix-based Avion line — sales of which grew 125% in 1991, according to Framingham, Mass.-based market research firm International Data Corp.

. . . lose some

Wang Laboratories, Inc. reported a \$6.8 million loss for the fiscal second quarter of 1992. However, despite a sales slump of 9% from \$442.2 million in the second quarter of 1991 to \$495.9 million, the quarterly deficit was not as big as the \$24.7 million red blotch posted last year at this time. Wang did report an operating income of \$3.9 million for the period. Selling off divisions tangential to the company's strategy inflated Wang's income, including the \$11 million sale of its Network Services unit. Separately, Wang said it sold its Voice Services Division to Unisys Systems, Inc. for an undisclosed sum.

TFLOPS supercomputer planned

Intel Corp. and the U.S. Defense Advanced Research Projects Agency (DARPA) have announced a combined effort to accelerate the development of a supercomputer capable of hitting 1 trillion floating point operations per second (TFLOPS). DARPA will contribute some \$21 million over five years to the project through the U.S. High Performance Computing and Communications Program. Supercomputers capable of TFLOPS performance will be used to tackle global climate modeling, mapping the human genome and analysis and modeling of ground waters and atmosphere, Intel said.

Chip maker restructures

Chips and Technologies, Inc. will restructure in an effort to focus on microprocessors. The company will make across-the-board cuts of 125 people, or 20% of its staff, by March 1 — above and beyond the 10% it cut last year. It will also attempt to sell its M/Fax multiprocessing architecture. A Chips spokesman said potential customers wanted an entire system, and Chips wants to focus on chip sets. Chips also said its "secondary results" due out tomorrow, will show a loss "substantially greater" than its first-quarter loss. According to analysts, the restructuring move was necessary for Chips' future viability.

Madge trounces Soderblom again

The UK Court of Appeal last week reportedly decided in favor of Madge Networks, Inc. in a patent infringement appeal by Token Ring patent holder Oldenbrook Madge, a unit of Taken Ring products, won the original UK patent suit in June 1990. Soderblom, which holds a U.S. patent on basic Token Ring technology and collects royalties from about 50 companies. Madge was the first vendor to challenge the validity of the patent in court; litigation is still pending between Madge and Soderblom in the U.S.

Unisys posts profit

Unisys Corp. last week posted its first quarterly profit in two years. In the period ended Dec. 31, 1991, Unisys net income rose \$80.5 million, up from a net loss of \$88.5 million for the period a year ago. Operating income also jumped to \$200 million, up from \$83.3 million a year ago, while inventory levels dropped to slightly more than \$1 billion — its lowest since 1986. Revenue for the quarter was \$2.46 billion, down from \$2.93 billion a year ago. Unisys attributed the drop to market weakness and revenue loss following the June 1991 sale of Tymplex, Inc.

Chase banks on 'info' access

BY ROSEMARY HAMILTON
CN STAFF

NEW YORK — Michael Dacey, an executive vice president of the North American sector at The Chase Manhattan Bank NA here, recently had a client on the phone inquiring about an obscure company in Finland.

It once took as long as a week to research this kind of request and dispatch the information to the customer, Dacey said. This time it took only minutes. While chatting with the client, Dacey tapped into his desktop system and, with a few keystrokes, retrieved reports on the company from one of Chase's databases, printed out a hard copy and faxed it to the impressed client before the end of the phone call.

"It took about six minutes, and I never left my desk," Dacey said.

Keep it confidential

The ability to handle his customer's request was important not only because of the quick turnaround but also because of the confidentiality. Since Dacey handled it himself, outside researchers were not alerted to his client's interest in this firm — a decided competitive advantage.

Dacey was using the Chase Information Exchange (CIX), a key piece of the bank's desktop strategy that has been under way since the late 1980s. CIX was designed in-house through partnerships with numerous computer and information service vendors.

The \$1.8 million development effort required the information systems team to pull together a variety of data from different Chase systems and external news and information sources. After a massive integration effort, the information can now be presented to the user on desktop systems in a standard, consistent format.

Less technophobes

The goal behind CIX and the desktop strategy overall is to make Chase's staff more competitive and less technophobic by giving employees easy access to information, said Craig Goldman, Chase's newly appointed chief information officer.

"Any program that requires me to learn technologies to execute I wasn't interested in," said Dacey, who served as a beta tester for the IS department.

The company is standardizing on Lotus Development Corp.'s Notes groupware software, a key element to its work-group strategy as well as another competitive tool, Goldman said. The bank has numerous Notes-based applications, including a client-tracking system that maintains information on accounts.

For example, an account manager can create a document outlining a recent conversation with a client. Co-workers can access that document and share related information that can be used in the next discussion with the client.

The focus on competitive tools is one reason Chase teamed up with several information services vendors.

Goldman said these partnerships allow Chase to work closely with developers and specify certain functions in products. By working with a vendor in the development stage, Chase often gets working product long before it is generally available to its competitors.

The bank's implementation of CIX and Notes is also an outgrowth of the strategy to move away from its mainframe-based environment of the 1980s, dominated by "islands of automation," to a desktop-dominated architecture tied to a worldwide network.

"We realized we had many platforms that didn't communicate and many products that were incompatible," Goldman said. Or, as Dacey put it: "We had data but no information."

Key pieces

Today, the key pieces are in place, and the information is at Dacey's fingertips. "We wanted information self-sufficiency at the desktop, and we've achieved that," Goldman said.

Chase is moving its users to a desktop hardware standard based on the Intel Corp. 80386 microprocessor but will be considering 486 boxes.

The bank is moving toward

Microsoft Corp.'s Windows environment as its graphical user interface and is upgrading its applications to Windows versions. The Windows selection helps Chase achieve its goal of a consistent, user-friendly front end, Goldman said.

It also provides an opportunity to reevaluate current desktop application standards, he acknowledged.

The bank will continue with three main desktop operating environments, including Microsoft's DOS, IBM's OS/2 and Unix because it believes it is better suited to certain applications that were developed for each of those platforms, Goldman said.

"Unfortunately, our vendors haven't evolved to the point of open systems," Goldman explained. "I have certain products that only run on Unix, others that only run on LAN."

Chase kicked off its systems overhaul by standardizing on two local-area network platform: Novell, Inc. and IBM's LAN Server.

Global network

The bank now runs on a global network of "various technology deployments," incorporating dedicated T1 and leased lines as well as IBM's Systems Network Architecture and Digital Equipment Corp.'s Decnet. However, the bank is considering frame relay.

This global network provides the critical "highway" to the desktop corporatewide, Goldman said. Chase staffers from a variety of locations can work together via electronic mail or Notes, he added.



Chase's Michael Dacey marks a user-friendly desktop

Hub central

Chase Manhattan will soon open a major IS center in Brooklyn, N.Y., that will serve as its primary IS hub in the U.S.

Work is near completion at Metrotech, and Chase CEO Craig Goldman expects the facility to open in March. Once it opens, Chase will begin moving 6,000 employees into the center.

Metrotech will also be a showcase for Chase's GUI-based desktop strategy, Goldman said. Since Chase is starting from scratch at Metrotech, it can ensure that its desktop strategy is implemented in a consistent fashion.

For instance, Intel 386-based systems have been installed, and Chase is implementing E-mail and Lotus' Notes "on every desktop," Goldman said. In addition, Microsoft's Windows will be the standard graphical user interface at Metrotech.

The facility will house "a large segment of our processing capability and a major segment of the staff," Goldman said.

Chase has a similar-size facility in England, he added.

ROSEMARY HAMILTON

Tough times for IS evident at dis-United Technologies

IS staff shrinks by 75% as divisions go their separate ways

BY CLINTON WILDER
CW STAFF

HARTFORD, Conn. — Information systems executives are becoming endangered species, and that's particularly true for the corporate IS team at United Technologies Corp.

Description: A massive cost reduction and a huge data center outsourcing deal have combined to reduce the number of corporate IS executives at United Technologies from a dozen to three in less than a year. Some moved to United Technologies divisions, some are working temporarily for other departments — and some have joined the swelling ranks of executive job seekers.

"I saw a lot less opportunity in the corporate office to provide leadership and direction," said Robert Forte, who recently resigned after 2½ years as director of information services at United Technologies. "I expect the search process to be an interesting one. It's a pretty soft market, and it will probably take a while, but I'm optimistic."

Forte was one of several IS executives who opted for a voluntary severance package at the end of 1991, part of the company's effort to slash 13,900 jobs and \$1 billion in costs to survive in the shrinking defense industry. But the paring of centralized IS also reflects a major change in management strategy after the failure of former Vice President of IS John Hammitt's ambitious plan to consolidate IS across United Technologies' diverse business divisions.

Dreams of economy

Hammitt, the high-profile executive who resigned last year, envisioned a huge corporate data center in which United Technologies divisions — multimillion-dollar entities such as Pratt & Whitney, Otis Elevator, Inc., and Sikorsky Aircraft — could gain economies of scale. The data center was built in Newington, Conn., but Hammitt was unable to sell his plan to every division — meaning potential consolidation benefits fell far short of expectations.

Last year — with the data center costs running \$5 million over budget by some estimates — the company announced plans to outsource data center operations to Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing subsidiary.

"If John had not started a consolidated data center, there would be no ISSC," said Dave Chassac, who took the severance package after three years as director of corporate MIS. He is currently working on a contract basis with United Technologies' treasury department through April.

With ISSC running the data center and the corporate IS staff cut back, IS management power has essentially been decentralized, passed back to the business divisions. "UTC is making strong moves now to become a holding company as opposed to a management company," Chassac said. "For the next year or two, I don't see much cross-division planning."

Eight executives who once reported to

Hammitt have departed or moved to divisions, including Paul Pace, formerly director of IS operations and planning; Director of Computer Services, Pierce Healey, who oversaw the data center consolidation; and Richard Evans, who was considered Hammitt's right-hand man.

United Technologies no longer has an IS executive at the vice president level. The top executive is UV Anderson, direc-

tor of corporate IS; he could not be reached for comment last week. The rest of the corporate staff consists of Carl Kuhn, who continues to head the telecommunications function, and David Whiteside, who along with Anderson was transferred from Pratt & Whitney's Canadian arm.

The Newington data center will handle United Technologies' corporate IS and processing for the Sikorsky and Hamilton Standard divisions. Corporate IS is currently processed at data centers at Hamilton Standard and

Pratt & Whitney, which declined to follow Hammitt's corporate direction.

"There was no apparent benefit to Pratt & Whitney IS staff member said. "We already had an economy of scale, due to our size."

Chassac noted that few divisions were willing to share in the costs of data center consolidation. "If you have to go to a new software release to get community, who pays for that?" he asked. "You're cutting directly into the profitability of that division if you pay. That was the real issue."



Porte saw fewer chances at United Technologies

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IBM router gets a thumbs-up

BY JOANIE M. WEKLER
CB STAFF

NEW YORK — IBM's debut in the multiprotocol router arena last week raised nays a user before but drew kudos from analysts who saw far-reaching benefits from the move, including significant IBM market share.

Router basics

IBM filled in gaps last week on its long-awaited bridge/router:

Availability: June 1992.
Network supports: Token Ring; Ethernet; serial, SDLC, X.25 and frame relay WANs.
Initially routers: IP-encapsulated SNA, NetBios over Token Ring, TCP/IP, Novell IPX, Decnet Phase IV, XNS.
With routers: AppleTalk II and NetBios over Ethernet (QLLP), native SNA through APPN (within two years).
Cost: \$9,995 to \$16,640.

IBM's announcement of the RISC System/6000-based bridge/router, slated to ship in June (see box), made no mention of performance — a key competitive selling point. The company was similarly vague about when the device would support IBM's own Advanced Peer-to-Peer

Networking (APPN) protocols. Fiber Distributed Data Interface networks and source-route transparent bridging.

IBM's low-to-midrange routing device does "nothing special if you look at it as just another multiprotocol router," said Todd Dugres, director of data communications research at The Yankee Group, a Boston-based consultancy.

However, he and several other analysts said IBM's blessing of multiprotocol routing over bridging schemes as well as Systems Network Architecture (SNA) encapsulation techniques should help boost the router market in general over the short term — probably to the benefit of its competitors.

Bringing in buyers

Over the long haul, "IBM will open up an entirely new market segment," the stalwart, SNA aficionado who is putting in LANs and doesn't "know how to network them," predicted Janet L. Hyman, director of network strategy research at Cambridge, Mass.-based Forrester Research, Inc. She said that by bringing in that new buyer, IBM is likely to capture 35% to 40% of a greatly expanded router market by 1994.

Several users with existing router installations said they see no reason as yet to start pepping their sites with IBM routers. "Unless I saw a huge price difference, clear-cut technological advantage or far superior performance, we wouldn't change," said Andy Marks, manager of data communications at L.A.

Geas in Los Angeles.

"I view IBM as a start-up in the routing business," said John Scogin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del., which runs a substantial SNA network along with many other protocols. He acknowledged IBM's experience with Transmission Control Protocol/Internet Protocol routing for the National Science Foundation's FTSNet network but said "there have been lots of hardware and software problems. I'd be very cautious."

Another large IBM shop, Austin, Texas-based American Cancer Society, is familiar with the IBM router "but probably won't need it," said Kyle Cooper, senior technical analyst for OS/2 communications. The reasons are a sparse array of disparate protocols — just SNA and Novell, Inc. IPX — and a decision to design its applications around IBM's Advanced Program-to-Program Communications, which allows IBM devices to communicate directly with each other. "That's all we need," Cooper said.

When IBM's router is enhanced to provide native SNA routing through APPN, IBM's scheme for coordinating resources among computing devices communicating directly with each other, "that's conceivable where they'll make their mark," Dugres said.

APPN support on the router is currently a statement of direction, said Jon Fyeld, IBM's product manager of network routing systems. In IBM parlance, that

means delivery within two years. He said IBM intends to license APPN Network Node code to other router vendors around mid-1992. Router makers Cisco Systems, Inc., Wellfleet and Proteon, Inc., have said they will license APPN when it is available.

Analysts agreed that the router symbolizes a more "open" IBM. "This product doesn't demonstrate the typical shackles of IBM architectures and religious arguments," Hyman said. She linked such prag-

matic decisions as not supporting APPN today as reflective of the December-reorganized IBM that "competes more tactically, product by product instead of with galactic architectures."

Frank Daubek, president of Communication Network Architects, Inc. in Washington, D.C., added, "For the first time in history, IBM released a Decnet protocol. Maybe IBM's statement about openness is more than just a marketing term."

Calling on Callpath

IBM last week replaced its Callpath Host offering with Callpath Call Coordinator CICS, a set of call management facilities linking IBM CICS-based applications with telephone calls. CICS is IBM's widely used database management software.

The fledgling Call Coordinator must be used with existing Callpath/CICS software, which was designed for IBM System/370 and 390 mainframes and will be compatible with multiple vendor's telephone switches in September. These include the Rakes 9750, AT&T Generic 2, Northern Telecom's Inc. SL-1 and the Siemens-Nicom 300, IBM said.

The product will reportedly provide basic inbound and outbound functions, including call data collection and scheduling of outbound calls. Users can also customize the software for specific functionality, including telephone load balancing. Jim Anderson, IBM's manager for Callpath solutions, said Call Coordinator "supercedes the 1989 product that worked only with Rakes switches and had limited inbound functions and no outbound functions."

Callpath is available on IBM mainframe, Application System/400 and Personal System/2 platforms. IBM is looking at the PS/2 for Call Coordinator, Anderson said, but currently has no plans to enhance Callpath 400.

JOANIE M. WEKLER

IBM launches SNMPship with Netview anchor

BY ELISABETH HORWITT
CB STAFF

NEW YORK — IBM last week not only integrated SNA, TCP/IP and Ethernet connectivity into a single router, but also introduced a full-function, graphics-based, Simple Network Management Protocol (SNMP)-based system to manage the resulting hodgepodge.

What may prove less provocative, industry analysts said, is IBM's stated intent of unleashing its AIX Netview/6000 into the free-for-all of today's internetworked local-area networking management market.

AIX Netview/6000 is a graphics-based system that runs on the RISC System/6000 AIX platform and was designed to manage Transmission Control Protocol/internet Protocol

(TCP/IP) and Ethernet LANs and routers, as well as other devices that support the SNMP protocol, IBM said. The product incorporates pieces of Hewlett-Packard Co.'s OpenView network management platform, under an agreement announced by the two vendors last year.

The product replaces IBM's existing AIX Network Management/6000, which had similar capabilities but far less functionality, an IBM spokesperson said. IBM will continue to support the earlier product.

IBM product manager Samiv Ahuja cited three features that he claimed differentiate Systech/6000 from competing SNMP systems, including HP's: an especially friendly graphics-based user interface based on the Open Software Foundation's (OSF) Motif; management of

IBM's AIX systems; and a bidirectional link to IBM's Netview.

The link to Netview allows System/6000 alerts to be correlated with Netview's Systems Network Architecture (SNA) management data, as well as incoming Token Ring LAN alerts from IBM's LAN Manager, Ahuja said.

The Netview link is unlikely to help sell System/6000 to the majority of "Internet environments" managed by SNMP, which are typically in the hands of a bunch of a bunch of routers — not the ones in the glass house," said David Passman, a partner at Ernst & Young. However, the link — and Netview/6000 — may gain popularity as more companies start looking seriously at integrating their non-IBM LANs and routers and SNA backbones, he added.

One company eyeing Net-

view/6000 is The Travelers Corp. The company is looking for an integrated way to manage a router backbone that will interconnect its IBM Token Ring LANs and also handle SNA traffic. However, The Travelers said it dislikes the prospect of having to install two LAN management systems — LAN Network Manager for the Token Rings and Netview/6000 for the SNM-based routers — as well as Netview, according to Robin Layland, vice president of SNA software engineers at The Travelers.

DHL Worldwide Express, a "mixed Unix shop" with a significant AIX installation, is "very interested in reviewing" both System/6000 and HP's Network Node Manager, according to John Payne, a communications architect at DHL. A major concern for DHL is being able to run whatever network management

applications it chooses on whatever integrated management system it selects, Payne said.

Application support is one area that IBM plans to expand on in future System/6000 announcements, Ahuja said. IBM is now working with several undisclosed independent software vendors to provide System/6000 for their products, he added. Longer term, the system will conform with the OSF's Distributed Management Environment. Potentially, this would mean that different network management systems such as IBM's and HP's will be able to share applications and data.

Ten vendors announced participation in a program to allow their devices to be managed by Netview/6000. They include Proteon, Inc., Synoptics Communications, Inc., Wellfleet Communications, Inc., Chipcon Corp., Network Equipment Technologies, Inc. and HP.

AIX System/6000 is set to ship in June with a \$9,950 one-time charge.

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E-mail 'Bill of Rights' issued for X.500 users

BY ELLIS BOOKER
CW STAFF

TAMPA, Fla. — While they yearn for the sort of coordinated, global directory defined by the emerging international X.500 standard, many electronic mail users want to see that this so-called Public Directory, which will contain information from both public and private E-mail systems, could compromise individual or corporate privacy.

Hoping to allay these fears even before X.500 becomes a reality, the North American Directory Forum (NADF) last week published what it called a "User Bill

of Rights" for entries and listings in the X.500 Public Directory.

"All the [NADF] members agreed we should highlight to the user community what their privacy rights will be," said Gary Rose, chairman of NADF's security and privacy subgroup and core services director at AT&T Easylink Services. Incoming members of NADF, a consortium of 17 of the largest E-mail network providers, will be expected to honor the rules he said.

"This kind of step certainly should be reassuring to individuals [concerned] about the privacy of their mailboxes," said Walter E. Ulrich, a director and E-

mail industry consultant at Arthur D. Little, Inc.

However, Ulrich went on to say that "for corporations, the real question is not what's to be listed, but how it is accessed." For example, he said, corporate customers may want to give their trading partners fairly free access into their internal employee directory but restrict this to head-hunting firms.

However, Howard Maynard, senior vice president of MIS at Young & Rubicam, Inc., said he was not concerned about this access issue and argued that companies will probably treat their Public Directory listings much as they treat telephone numbers today.

The advertising giant was an early adopter of the X.400 electronic messaging interconnection standard; it installed a Native X.400 local-area network in 1989.

Still, Maynard said he was concerned that the NADF rules do not seem to encompass the global E-mail environment — a special concern to Young & Rubicam, which has offices in 45 countries.

Seven up

The seven X.500 "rights" enumerated by the NADF are as follows:

- The right not to be listed.
- The right to have you or your agent informed when your entry is created.
- The right to examine your entry.
- The right to correct inaccurate information in your entry.
- The right to remote access of information from your entry.
- The right to be assured that your listing in the Public Directory will comply with U.S. or Canadian law regulating privacy or access to information.
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Motorola builds on wireless MAN

BY ELLIS BOOKER
CW STAFF

SCHAUMBURG, Ill. — Motorola, Inc. last week broadened its already substantial presence in the wireless networking arena, by announcing it had reached an agreement with Racotek, Inc. to develop and market the firm's technology for transmitting data over trunked radio systems.

Based in Minneapolis, 3-year-old Racotek already claims a handful of customers for its Raconet MAN wireless metropolitan area network (MAN) for voice and data that links mobile workers with their offices. Racotek's system puts data channels on top of the voice channels carried in Motorola's Spread Spectrum Mobile Radio (SSMR) system. The SSMRs work at 800 MHz and 900 MHz and are available in some 1,100 locations nationwide.

Motorola said it will produce two-way radio modems designed to work with the Raconet. Customer field trials of the wireless MAN will begin later this year, the company said.

The Raconet MAN will be Motorola's third wireless network venture. In mid-1990, Motorola and IBM launched Advanced Radio Data Information Services, a nationwide, two-way packet radio data service that claims some 35 corporate customers. In March, Motorola will switch on Electronic Mail Broadcast to a Routing Computer, or Embarc, its nationwide, one-way radio system for sending E-mail to mobile workers.

Financial details of the Motorola/Racotek partnership where not disclosed.

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State seeks to tax mail-order sales

Ruling could lead smaller firms to increase costs, forcing customers to seek alternatives

By MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Supreme Court last week heard final arguments in a high-stakes case that may determine whether small mail-order computer vendors can keep their price advantage.

The case before the court pits Quill Corp., an office products catalog vendor based in Lincolnshire, Ill., against the state of North Dakota. At issue is North

Dakota's law requiring out-of-state mail-order companies to collect a 5% sales tax. The court's decision is expected by June.

Under a 1967 ruling known as *Bellas Hess*, sales tax is charged only if the mail-order company has a "physical presence" in the state, such as an office, store or other facility. Many revenue-hungry states want to overturn that ruling in order to levy a tax on virtually all mail-order purchases.

If North Dakota wins the pending Su-

preme Court case, all states will be able to force out-of-state mail-order houses to collect taxes. This would raise customers' final costs and reduce the price advantage of mail order, according to Chuck Barney, an industry analyst at International Data Corp. in Framingham, Mass.

Customer will pay

Because of their lean profit margins, mail-order personal computer vendors cannot further cut prices to offset the taxes, so the "tax hit" will land fully on customers,

Barney said. That may nudge users toward other channels, such as superstores, and reduce mail-order company profits, he added (CW, Oct. 21, 1991).

The ruling would be only minimal impact on large mail-order vendors such as Dell Computer Corp. and Compuadd Corp., both in Austin, Texas. The firms have retail stores in many states and already charge state taxes.

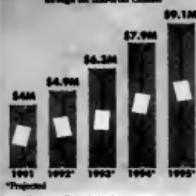
Jeffrey Davidson, controller at Phillips Properties, Inc. in McAllen, Texas, said he does not mind paying the tax for mail-order PCs, but he predicted that small-mail-order firms would be hurt. "We will see serious consolidation in that area," he said.

Small companies such as Microsoft Software, Inc. in Hunt Valley, Md., and

Where's the check?

Despite potential legal obstacles, the PC mail-order business will comprise 30% of all indirect sales by 1995, up from 24% last year.

Value of U.S. PC and workstation sales through the mail-order channel



SOURCE: Workpath Technologies, Inc.

Personal Computing Tools, Inc. in Los Gatos, Calif., were part of a coalition of direct marketers that opposed North Dakota's tax law.

The Quill case involves the constitutional principle that states should not impose taxes on interstate commerce unless the state has some relation to the business.

North Dakota officials said the "physical presence" test is outdated because of the emergence of such long-distance shopping options as catalogs, telemarketing and videotext.

North Dakota argued for a looser "economic presence" test, which would apply state taxes if the mail-order company solicits business in the state.

Creating problems

The Direct Marketing Association (DMA), which opposes the law, argued that it would be an administrative nightmare to calculate and collect taxes in the nation's 6,000 taxing jurisdictions, which have different tax rates, exemptions and filing rules.

North Dakota countered that today's computers and accounting systems can handle the job.

Vertex, Inc. in Bensenville, Ill., for example, markets a multistate tax-compliance software package for \$15,000 to \$20,000, according to company President Ray Westphal. However, the DMA said that price is too steep for small mom-and-pop mail-order companies.

State officials and their allies complained that mail-order firms have an unfair advantage over local merchants, who must charge sales taxes.

Staff writer Carol Hildebrand contributed to this report.

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The right choice.

DEC aims to lower midrange entry costs

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. is expected to extend its Microwax 3100 line tomorrow with low-end models that are said to significantly lower the cost of entry into mid-

range computer systems.

DEC will unveil two 5-VAX Units of Performance (VUP) machines, capable of an estimated 21.6 transactions/sec. based on the A-Level benchmark from the Transaction Processing Council, a consortium of major industry vendors. The systems, Models

30 and 40, will be priced at approximately \$8,800 and \$11,500, respectively.

The new systems replace the Model 20E, sources said.

In addition, DEC will unveil the Model 80, a 10-VUP system that has been tested at 27.9 transactions/sec., sources said.

Its price tag hovers at about the \$18,000 mark.

The price of the existing 3100 Model 10E will be cut to approximately \$6,000, roughly a \$1,000 reduction.

With the new systems, DEC will also offer a higher performance small computer systems interface that performs at 4M byte/sec.

The vendor is continuing its

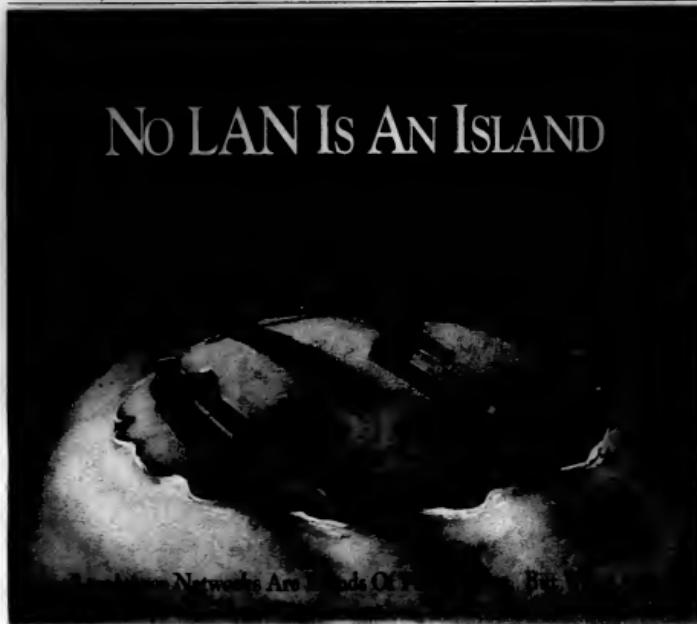
push toward "smaller, faster and cheaper" in the midrange computing market, said Wes Melting, an analyst at Gartner Group, Inc. in Stamford, Conn.

DEC's Microwax 3100 series machines are used most often to run distributed applications and thus compete most directly with IBM's Application System/400.

Currently, the lowest AS/400 B35 offers about 10 transactions/sec. at a cost of \$18,662 per transaction, while the DEC Model 30 comes in at approximately \$10,900; the DEC Model 40 at \$10,969; and the DEC Model 80 at \$10,166.

One DEC user, John Claxton, manager of systems and networks at Intertel Industries, Inc. in Mount Airy, N.C., said the price/performance of the new 3100s will allow him to consider purchasing the new boxes as more drawn wire mills are added to his data processing network. He will then to move the older DEC systems into smaller sites.

DEC is also expected to announce three separate interfaces to Posix under VMS.



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Blue wave

Not to be outdone in the midrange arena, industry insiders claim, IBM will soon introduce its next-generation AS/400 systems — perhaps as early as next month.

The E series would replace the current top-of-the-line D series models in price/performance by offering a faster processor for approximately the same \$13,000 entry price as the D2.

Sources speculated that the new line will offer a three-way processor, and all existing AS/400 models will be field-upgradable to the new generation. Currently, the top-of-the-line D80 provides dual-processing capability.

ADM, Inc., a Cheshire, Conn., consulting firm specializing in the midrange marketplace, said it expects IBM to officially roll out the E series systems sometime in the next 30 to 60 days, as a continuation of IBM's annual AS/400 software enhancements.

The D models, the last major revision to the series, debuted in April.

IBM will also soon be offering Version 2 Release 1 of its AS/400 operating system, as well as introducing a Posix interface.

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Ernst & Young CASE quality service bows

BY KIM S. NASH

CWT STAFF

NEW YORK — Ernst & Young unwrapped a service last week that targets experienced CASE users who want to straighten out organizational kinks in their soft-

ware development projects.

Development Effectiveness is a seven-phase total quality management plan said to address problems in information systems groups that undermine support for new technologies, such as computer-aided software engi-

neering (CASE), according to Vaughan Merlyn, head of Development Effectiveness.

"IS departments, compared with finance, distribution and other corporate functions, top the list when it comes to project failures," Merlyn said.

One common mistake IS groups make is funding software development on a per-project basis, without a holistic approach to how the company manages data, he said.

IS organizations usually hit a roadblock by taking a tools-only

approach to CASE, with no regard for development methodology, Merlyn added. A shared vision for technology projects — and information handling — is crucial to keeping CASE going, he said.

Development Effectiveness, which costs anywhere from \$50,000 to several million dollars, depending on the scope of the engagement, was designed to address those kinds of management problems.

Saving the CASE ship

The new service should be useful in a market where CASE is quickly sinking on the to-do lists of IS executives, according to Andrew Mahon, senior analyst at New Science Associates, Inc., a market research firm in Southport, Conn.



Ernst & Young's Merlyn says key to Development Effectiveness is holistic approach

"Putting a business context around the tools" will help keep CASE alive, he said.

Ernst & Young consultants lead IS and business-side managers through several surveys to assess the company's CASE readiness.

Merlyn said he has found that while many companies have piloted CASE projects, few have adopted CASE broadly as the primary application development approach.

"Making the transition from pilot to mission-critical programs gives rise to cultural problems users are unprepared for," and Development Effectiveness helps people recognize those stumbling blocks early on, Merlyn said.

So far, eight North American and European companies are using the method, but Ernst & Young declined to identify the customers other than to say most are in the financial services industry. One, Merlyn said, is a large-scale systems integrator.

Development Effectiveness is CASE methodology-independent, but some early adopters have been Ernst & Young Navigator series customers.

Two of the eight users are about to roll out major applications developed under the Development Effectiveness rubric, according to Richard Phelps, associate director at Ernst & Young.

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TECH TALK

Brainy cars and roads

So the National Research Council's Transportation Research Board has released a report proposing a program to research, test and implement "smart" highways and vehicles. There are four technologies involved, the report noted: advanced traffic management systems, traveler information systems, vehicle control systems and commercial vehicle operations. Smart highways and vehicles would allow for rapid response to road accidents, traffic-flow management and ramp metering on freeways, among other benefits.

No Mickey Mouse sound

Phoenix Technologies Ltd. has signed a pact with Walt Disney Computer Software, Inc., that will enable Phoenix to sell Disney's Sound Source technology to personal computer manufacturers. Sound Source technology provides OEMs with a cost-effective way to incorporate speech, music and sound effects in desktop and laptop computers, Phoenix said. The technology permits playback of sound files specifying Microsoft Corp.'s Multimedia Extensions for Windows, in addition to software designed to support Sound Source.

Artificial ledger

IBM computer researchers have built a prototype computer system that could become the fine art repository of the future. It is a small computer system designed for storing, cataloging, displaying and reproducing color images of paintings and other graphic artworks, according to IBM. The prototype's images are good enough to be used to produce high-quality art books, the company said. The system consists of two IBM Personal System/2 Model 80 PCs, a scanner, a color monitor and an optical jukebox. The prototype has been installed at the Wyeth Collection's offices in Chadds Ford, Pa.

Recreating the human brain cell

Analog chip imitates 'sensory experience' in drive to replicate our irrational thought

BY CLINTON WILDER
OF STAFF

Computer scientists around the world are working to develop neural network software that mimics the human thought process more closely than digital computers do. But suppose there was neural hardware that programmed neuron-like processing directly onto computer chips?

Such technology is moving closer to reality at the California Institute of Technology in Pasadena. Caltech student Misha Mahowald, working with researcher Rodney J. Douglas at the University of Oxford in the UK, has developed a "silicon neuron" chip modeled on an organic brain cell.

Full-scale applications of the technology are years away, but they could include enhanced processing of sensory data, advanced artificial intelligence systems for decision support and robotics, among others.

Because the neural processes are embedded in silicon rather than software, orders-of-magnitude efficiency improvements over existing neural networks are possible.

Neural network programs are generally so large and complex that they require huge memory capacity and are a major processing challenge for even the most powerful computers available today.

Standard digital computing and integrated circuit logic is based on the assumption "that thought is a rational process," Mahowald pointed out. "But it really isn't. You think in patterns that are based on your sensory experience. We are hoping that by starting from the



Researcher Mahowald is blending an academic background in biology with an interest in electronics to develop a silicon neuron chip

silicon chip known as the "silicon retina" set the stage for the neuron chip (see story below).

The silicon neuron was designed as an analog chip because analog signals more closely resemble natural behavior than digital signals. "In a neuron, the membrane acts like a capacitor — the pores open and close based on the potential across the capacitor," Mahowald said.

On the neuron chip, each circuit represents a different kind of membrane channel. "Once we had the basic analog design, we just keep adding different kinds of inputs. It's very modular," Mahowald added.

She and Douglas did their first experiments at the University of Cape Town in South Africa, where Douglas was working. Since he moved to the UK, the two researchers have done most of their work together at Caltech.

Their latest breakthrough is a prototype chip containing five silicon neurons. Initial production of the chip will take place at a fabrication facility funded by the U.S. Defense Advanced Research Projects Agency.

Mahowald said she is confident that neural chip technology will progress, but she never underestimates the complexity of the human or animal nervous systems that she and Douglas are trying to model.

So far, neurobiologists have praised the silicon neuron as behaving remarkably like real neurons. But Mahowald said she believes that neural chip design is just beginning to scratch the surface of this complex field.

"Remember, all we can really capture in silicon is a snapshot of a neuron, because the neuron is always changing — it's living and it's aging," she added. "No matter how much we do, [a chip] may never be that close to a real neuron. Then again, it might. We just don't know yet."

An electronic eye

When designing a computer chip to act like a human brain cell, figuring out what not to process is as important as what to process.

This type of electronic "filtering" was key to the silicon retina, a vision sensor chip developed by Caltech Professor Carver Mead. Many of the same principles used in the silicon retina are used in the silicon neuron developed by Mead's doctoral student, Misha Mahowald, and researcher Rodney J. Douglas.

Unlike most computer sensors, the silicon retina does not attempt to capture everything, but rather only what the human eye would see and process. It is "fooled" by the same kinds of optical illusions that deceive humans, for example.

That principle could have far-reaching implications for saving communications bandwidth in video transmission applications. Instead of moving all video data, which can be slow and expensive, a transmission based on the "sensitivity" principle might transmit only the images sensed to be critical.

"In any given TV image, only a small number of pixels in any given scene are important," Mahowald said.

The principle applies to sound as well. A traditional sensor will record all sound frequencies, though that is not the way the brain processes aural input. "When someone speaks, you don't hear all the exact frequencies," Mahowald said. "You hear the words and you know what they mean."

CLINTON WILDER

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EDITORIAL

Stupid Cupid



Birds do it. Bees do it. Even the flowers and the trees do it.

Yes, users are falling in love. With apologies to the late Cole Porter, who wrote the bars above, the object of their affections is client/server architecture. (All right, so maybe Cole had something else in mind, but this is the '90s, not the '30s.)

But there is one thing all love holds in common, no matter what the object of adoration. And that is its ability to confound and confuse the reality of certain situations; you know, love is blind and all that stuff.

In the current affair between user companies and client/server architecture — and a torrid affair it is — the offloading of applications from hosts to smaller and cheaper hardware platforms is often confused with the decentralization of IS. As is evident in most companies, that is really not the case at all.

Quite the contrary. The porting of host applications to server-hubbed networks of PCs and workstations requires an extraordinary coordination effort. The object of that effort is to move technology quickly into and throughout business units to facilitate local decision-making at the point of contact with the customer. But that does not mean that IS abrogates responsibility for evaluating, purchasing and implementing client/server technology to the business units. There's just no body of evidence that shows this to be the case in very many companies.

The problem is that non-IS executives in some corporate offices have seized on the client/server boom as a signal and a means to move control of the IS resource away from a central core. Over time, as central IS really does disband and move itself into the business units, that strategy becomes feasible.

For the present, decentralizing the IS management function can undermine and even subvert the inexorable and very necessary downizing movement. Forward-thinking companies are embracing client/server and the downizing movement in general. But they are not neglecting the requirement of a high level of centralized orchestration of this movement at this early juncture of the "dehostification" of corporate IS.

Bill Loberis

Bill Loberis, *Editor in Chief*

Editor's note: A "Fifth Wave" cartoon on page 2 of our Jan. 13 issue reinforced a negative stereotype of Native Americans. The cartoon was inappropriate and should not have been published. Both Computerworld and cartoonist Rick Tennant regret any offense this may have caused our readers.



LETTERS TO THE EDITOR

CA will retain lead

"Big Blue gains in mainframe security" [CW, Jan. 6] cited a 1991 study conducted by Sentry Market Research (SMR) and used anecdotal evidence to form a hypothesis, while using SMR data to support it. SMR disagrees with some of the conclusions.

SMR's research supports the conclusion that Computer Associates International, CA, is and will remain the leading vendor of data security software for IBM mainframe systems for the near-to-midterm future.

A misinterpretation could occur when you use SMR's purchase intention data to infer defections from RACF and Top Secret to RACF. While the software market is shifting from one vendor to another anecdotally, SMR's data does not show this to be a sizable trend.

Also, you contend that IBM is better suited to address the multiplatform, distributed security market. In SMR's opinion, CA is also well-suited to support a multi-vendor approach based on its support of multiplatform operating environments and platforms.

William A. Goetz Jr.
SMR
Westboro, Mass.

of alternatives to improve productivity — CASE tools, fourth-generation languages and code generators. These technologies have made an attempt over the years to change the face of IS capabilities, but they never offered the breakthrough improvements demanded by an increasingly competitive business environment.

These tools have been around for years, and yet the system backlog has not shrunk appreciably. Object-oriented technologies, however, are delivering that breakthrough promise.

We are now implementing a large and complex mission-critical application using an object-oriented system development tool called Sapiens. The only "rule of thumb" we have had is that if we exceed our initial optimistic projections, we have seen an order of magnitude improvement in productivity and system development, time over that of CASE tools.

All of the above real-world experiences are in direct opposition to Mr. Goetz's opinions.

David B. Johnson
Siemens Energy &
Automation, Inc.
Alpharetta, Ga.

... and again

OOP slighted . . .

After reading Martin A. Goetz's article in Viewpoint [CW, Jan. 13], I did not know whether to laugh or become angry. Blanket statements that object-oriented programming (OOP) will not live up to its promise and will not fare any better than its predecessors are proof that Mr. Goetz is not adequately versed in OOP.

Mr. Goetz presented his list

Your article, "Object orientation not cure for IS headaches" [CW, Jan. 13], demonstrated that you truly do not understand object-oriented programming (OOP).

The three points you identify as problems can be resolved by any novice object-oriented developer by applying the benefit of the OOP paradigm to the problems.

You are absolutely correct that object orientation requires a "massive analysis task," that

"maintaining purity is hard" and that "objects require upkeep."

No company in its right mind would try to analyze all its systems in object-oriented terms immediately. The analysis task can therefore be localized to the objects that are necessary for a specific system.

Second, the need in an object-oriented environment to maintain object purity does not exist. A basic concept of OOP is that the testing of objects is localized to the objects that have been changed. An object that behaves properly for one application will behave properly for all applications that use the object's documented protocol.

Finally, your profound statement that "objects require upkeep" left me completely dumbfounded. Has anybody ever developed a software system that did not require maintenance? An object management group should be formed whose task it is to maintain and test these reusable objects. I guess this is a completely new concept, for an industry in which large software systems have been routinely designed and developed by accountants, financial planners and managers for the last 10 years.

Bill Hyman
Charlottesville, N.C.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Loberis, *Editor in Chief*, Computerworld, P.O. Box 9171, 375 Cockitshill Road, Framingham, Mass. 01701. Fax number: (508) 875-8901. MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

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The death of personal privacy

CORINNE CHAVES



I am an information technology professional who, among other tasks, creates enterprise data models, designs databases and monitors technology for possible applications to my firm's business.

What I know about what can be and is being done with technology in terms of tabulation, compilation and storage of data involving the details of private lives has given rise to a growing personal concern about the future of privacy. If nothing else, I would like the creators of databases to think about the ethical considerations relevant to amassing large amounts of behavioral data about individuals.

The violation of personal privacy, which today is possible through the use of customer databases, ISDN source telephone number recognition, personnel files, insurance records and so on, is staggering.

Even if you pay cash, you cannot stop at some stores without giving your home phone number. From your number, the merchant can determine your name and address.

If you are a credit card user, your credit card vendor can compile a list of your favorite restaurants, the trips you have taken,

the hotels you have stayed at and the gifts you purchased while traveling. The hotel companies' databases will know that you requested an iron, a makeup mirror and extra towels, that you or-

The telephone company also has a record of all your telephone calls, both local and long distance, which can then be used to create a profile of your communications habits.

know you got a new car loan from Honda. They know your car note is \$350 a month. They know you live on an Accord. You have 20 million miles on your Accord? Where are you going when you do all that extra driving? After all, your job is local.

However, it's no one's business where you are, as long as you're not doing any harm. As a private individual, my temptation is to become a hermit, pay exclusively on a cash basis, disconnect my telephone and only sleep in stores that don't request my phone number or other identifying information.

Unfortunately (or fortunately), I don't really want to be a hermit. I like people and I like to interact with them, but there is virtually no way to do this without being put in a database somewhere.

As a professional, I feel strongly that we need to build provisions into the databases we create to flag those subscribers, customers and clients who choose not to be included in mailings, who choose not to have their names sold and so on. And, of course, we must give those individuals the opportunity to designate their preference. I hope that this will ultimately be a legal requirement.

In the interim, we can actively build in the security and take the measures required to safeguard one another's privacy.

Chaves is manager of decision support systems at The Primes Co., in Menlo Park, Calif.

dered room service for two and that you had an 8 a.m. wake-up call.

If you call to make a catalog purchase and get a busy signal, the vendor may call you back. You don't even have to leave a message. The new ISDN source-routing tags source phone numbers and register them, so the company's phone switch can later retrieve and display them,

All of that information is in the hands of many of total strangers. As an individual, have no way of knowing the level of integrity of the people handling your information. Moreover, the firms with which you do business have no way of knowing the level of integrity of their employees.

But they sure do know a lot about you. They know you buy gasoline once a week. They

Bush in Japan: So why not chips, computers, software?

CHARLES P. LECHT



Cars, cars and more cars, as well as a bit of rice, seemed to be the primary issues under consideration during President Bush's recent trip to Japan.

Maybe this was because the president, accompanied by no less than 21 leaders of U.S. industry, had no one along more prestigious than the chairman of Chrysler, General Motors and Ford. Maybe it was because these three were so hell-bent on getting Japanese about to buy U.S.-made cars and car parts and on getting Japanese industry to stop shipping so many of their own products.

This caused chip manufacturers and sales statistics to be biased against Japanese companies. This is the equivalent of calculating market share numbers in the automotive industry and leaving out car production by Chrysler, GM and Ford.

Japanese people are not buying American-made computers or software. Virtually all good-size Japanese computer systems are running U.S. software in the operating systems and utilities areas.

the famous chip pact been satisfied? Are Japanese people and companies buying more American-made chips and computers?

The simple answer to all those questions is "no," but those things are seldom simple.

Take the chip pact: The reason it has never been satisfied is that the chip problem the pact was meant to cure was never really there. The statistics we have been given over the past five years have been dubious at best. They excluded the chips made by America's biggest chip manufacturers for high-tech use on in-house products.

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language documentation support; and no local maintenance.

What they are buying, however, are foreign-made American computers such as those made by IBM Japan, which has the lion's share of the business systems computer market in Japan.

However, it's true that there has been a recent softening of interest in American-made supercomputers because companies such as Fujitsu, Hitachi and NEC have managed to create highly competitive supercomputer versions graced with complete Japanese-language support.

Indeed, the versions are so competitive that many other countries have decided to import them instead of U.S. offerings (despite the inherent difficulties of Japanese manufacture and documentation may offer).

But it should also be noted that, for two decades, our supercomputers were actively sought by Japanese government institutions and major corporations, despite their lack of Japanese-language support.

In the software arena, very little complaint by the U.S. trade group can and will be heard. Virtually all good-size Japanese computer systems are running U.S. software in the operating systems and utilities areas.

These include such notables as DOS, Windows, OS/2, Lotus 1-2-3, Wordperfect, Wordstar, Dbase and Macintosh systems software — all of which have been converted to operate using the Japanese language.

U.S. companies receive royalties and other forms of remuneration for these products sold in Japan. I am unsure of any major Japanese-language software products that can run on American computers or any that have been converted to English for that purpose. There is some process control and communications software in the U.S. of Japanese origin, but you could hardly call it widespread.

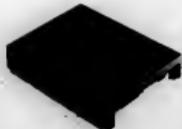
So, despite the fact that the trade team has mentioned American software as one of the items they would help gain access to the Japanese marketplace, they'll be hard-pressed to find any not already here.

It's no wonder the president offered his personal endorsement services to Toys R Us instead of IBM, Motorola, Texas Instruments and the other American microchip/computer companies on the Japanese arcticop. He didn't have to.

Lecht is an IDG News Service foreign correspondent based in Tokyo.

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SYSTEMS & SOFTWARE

Storage Tek eyes small tape library sites

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp., which already has more than 95% of the automated tape library (ATL) market, plans to break out of the glass house by 1994.

Having nearly saturated the market for tape libraries in large data centers, the \$1.14 billion firm is eyeing smaller sites in order to boost sales of ATLs. During the next two years, it also plans to upgrade existing libraries owned by its 500 data center customers and to sell its new linear redundant arrays of inexpensive disk drives as an alternative to IBM drives [CW, Jan. 20].

To widen its network for new customers, Storage Tek has al-

ready made the effort to port its ATLs to a wide variety of computer architectures, all of them host systems. These include Digital Equipment Corp.'s VAX, Cray Research, Inc.'s supercomputers, Unisys Corp.'s 1100/2200 series, Bull HN Information Systems, Inc.'s 9000, Siemens AG's 7590 and Fujitsu Ltd.'s M series.

Since ATLs can be used to retain official "images" of corporate databases, there is no reason why they cannot serve as the repository for all the critical data within an enterprise, even data from networks of personal computers and Unix workstations, analysts said.

It would not be impossible to imagine Storage Tek selling down-sized ATL systems, ac-

cording to Robert Callery, a senior storage analyst at TechnoLogy Investment Strategies Corp. in Framingham, Mass. "I think

they have a long-term strategy to sell smaller libraries into the distributed environment, including PC LANs and Unix net-

works," he said.

However, that distributed data would most likely be routed to a host computer before storage in an ATL, analysts said. "Storage Tek's goal is to become the [systems-managed storage vendor] for the open environment," said Roseane Googin, a senior industry analyst at Gruntal & Co., a Los Angeles stock brokerage. "I don't see anything else doing that."

Last October, Storage Tek's chief executive officer, Ryal Papier, announced a new series of downsized libraries designed to attract smaller types of ATL customers. The current 4400 Automated Cartridge System library provides 1.27 bytes of storage capacity among 6,000 tape cartridges. The future ATL versions, identified by their Storage Tek code names, include Redwood, a 1994 device that would

Continued on page 32



Source: Computer Intelligence

CW Chart: Michael Suggs

D&B's direction focus of user concern

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software may have to step up its plans regarding product information and delivery of its mainframe accounting software in order to keep current customers satisfied.

A recent study of 100 IBM mainframe sites by International Data Corp. (IDC), a market research firm in Framingham, Mass., showed that while D&B Software customers were pleased with their vendor's support and service company and product directions were an "area of concern" at IBM sites

where D&B Software was identified as the primary accounting software supplier.

Looking for specifics

"It would be in [D&B Software's] best interest to be much more vocal and specific about product futures and directions," said Clare M. Gillan, director of the IDC study.

"At the last convention, D&B told us that they are not looking to improve what we have today. Instead of patching that and fixing that, they are looking to the future, which is client/server," said Les Palmer, co-chairman of Alliance Week, the national D&B Software user group conference.

Palmer, who is fixed asset accounting manager at Hallmark Cards, Inc., said he is confident the vendor will support its current products as long as there is a marketplace demand.

D&B Software has an installed base of more than 10,000 users worldwide on its E and M series mainframe accounting systems.

D&B Software announced its intention last year to migrate users over to a client/server-based strategy.

While the vendor has made alliances with companies such as Powersoft Corp. and Sybase, Inc. to provide graphical user interfaces and database strategies,

to date, no prototypes of the products have been delivered or demonstrated for any user organization.

Not everyone is ready to jump to client/server, Gillan said, but users need to know what their supplier is doing.

Supplier's products

Classifying D&B Software's existing products as "superior," Michael Conhead, vice president of MIS at JMB Retail Properties Co. in Chicago, said D&B Software is "not leading the pack" in the client/server arena.

JMB has been an M series site for more than eight years, and Conhead said D&B Software's latest marketing literature for the mainframe product line has taken on a "cookie-cutter" qual-

ity: "It is OK and reasonable, but they are not showing us that they are differentiating themselves from any other mainframe software supplier."

Conhead speculated that some of the flamboyance may have been taken out of the vendor's message when John Landry, D&B Software's chief technologist, left suddenly last month to take a position at Lotus Development Corp. in Cambridge, Mass.

"They no longer have an articulate, eloquent speaker to present the client/server image to the public," Conhead said.

Sources have speculated that a general ledger version of the client/server product will be rolled out by D&B Software sometime this quarter.

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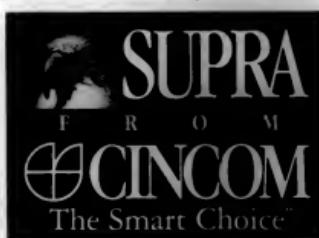
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Planning spells results at MCI

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — MCI Communications Corp.'s order-entry system for residential customers is as mission-critical as applications get, and when its transaction volume soared 70% in three months last year, MCI's technical staff had to scramble to keep response times within bounds.

The reason for the surge in activity: the success of MCI's new Friends & Family service, with which an MCI customer can designate up to 12 other MCI users in a "circle of callers" who get a 20% discount on long-distance calls. Overnight it became the

company's most successful product rollout ever. Millions of circles were established, each associating multiple customers with an account in the database.

Computer capacity planning and performance management are critical activities at MCI, where double-digit annual growth is the norm and computing does not just support the business — it is the business. In a recent report criticizing federal agencies for doing a poor job of capacity planning, the U.S. General Accounting Office cited MCI as an organization with a successful capacity management program (see story below).

MCI has 21 specialists devoted to capacity planning and performance management, with seven doing capacity planning,

nine engaged in consulting and software engineering for performance optimization and five devoted to monitoring and tuning production systems.

Perpetual planning

A key element in MCI's approach to planning is to do a lot of it, said James L. Zucco, senior vice president for systems engineering. Five-year plans are updated annually, annual plans are revised quarterly, and quarterly plans may change biweekly, he said. Practice makes perfect, apparently — Zucco said MCI's capacity planning staff has such a good track record that top management will accept, with little question, a recommendation to spend millions on a system.

However, MCI does not avoid bottlenecks by laying in a lot of excess capacity. The company's 13 IBM mainframes remain nearly flat out, according to Lee Scanzetti, director of systems engineering.

The planning process takes input from three major sources. Sales projections translate readily into minimum measures such as numbers of new customers, call volumes, customer bills and the like. Those go into a computer model developed by MCI, as do service-level objectives such as response time. Out of the model flows capacity requirements for each of MCI's five data centers, indicating the need for hardware resources such as off-line and on-line storage, main memory and processor power.

Capacity planners also factor in advance notice of new soft-

MCI has the following:

MCI uses capacity and performance tools such as:

CW Chart: Jerry Gosswein

ware coming from MCI's applications developers and forecasts of new technology from industry research firms and vendors.

Positive planning often gives way to a proactive performance management role, Zucco said. New applications are stress-tested on IBM's Teleprocessing Network Simulator, and servers are found to be a scarce hog faces additional work before being put into production.

Once applications are in production, MCI uses a variety of automated tools to spot abnormal patterns, looming bottlenecks and other trouble spots. When they are found, the consulting group works with users and software developers to tune applications or to smooth work loads. "They are the conscience of the organization," Zucco said.

He estimated that without this proactive approach, MCI would have 50% more computer capacity. "We don't just draw a

straight line [to do capacity planning]."

MCI uses more than a dozen software products from IBM and third-party vendors for capacity planning and performance monitoring. But Zucco said the tools produce a flood of information. The trick is knowing what statistics to look at and what conclusions to draw from them, he said.

Surprising success

Zucco said capacity planning for a new service begins as soon as the service is "a giant in marketing's eye." Even so, the surge in system activity that accompanied the introduction of Friends & Family was more than anyone had predicted. The short-term solution was to tune the application, Zucco said. Meanwhile, MCI upgraded its mainframes and added another machine. "We also shed some lower-priority applications," Zucco acknowledged.

MCI as role model

The GAO recently cited MCI as an example of a firm that does a good job of computer capacity management. The audit agency was best known in its assessment of the Federal Aviation Administration (FAA) and the National Institutes of Health (NIH).

Two of the six IBM mainframes the NIH has leased since 1986 were "underused," costing the agency \$16 million, the GAO said. In analyzing five of the NIH's six 3000-200 computers, the GAO found that NIH managers averaged 45% of capacity. The reason, according to the GAO: "Computer center managers ... [did] not monitor either utilization or perform mid-term review of their capacity management programs."

In a separate report, the GAO said the FAA had not implemented effective computer capacity management practices for its automated systems. Despite spending \$3 billion annually on information technology, the agency lacks adequate policies, procedures and tools for capacity management, the GAO said.

Intergraph gives boost to Clipper performance

BY MARTY FRAN JOHNSON
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp. shored up its wobbling position in the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) market recently with a family of servers and workstations said to deliver three to six times the performance of the current Clipper per line.

"I think they're off the hook," said Charles Foundry, president of DaraTech, Inc., in Cambridge, Mass. "They were up against the wall. They absolutely had to do that."

With a claim on nearly 16% of the \$7.3 billion CAD/CAE market in 1991, Intergraph's line of Clipper workstations had slipped dramatically behind in performance compared with its toughest rivals: IBM, Compa-

tions, and Hewlett-Packard Co.

The appearance of the new Clipper — available in March — will boost Intergraph's line "to the top 20% of the workstations out there in this particular category," said Ken Anderson, publisher of "The Anderson Report's Technical Guide to Unix Engineering Workstations." "Intergraph really focuses on responding to their customers, which are primarily CAD users."

Based on RISC chip

The new machines are based on Intergraph's C400 reduced instruction set computing (RISC) processor. This second-generation chip incorporates superscalar and superpipeline architecture, and it features a separate floating-point unit.

The Series 2400 desktop and Series 6400 desktop worksta-

tions and servers offer 33 SPECmarks of performance. Company officials said they plan to scale the C400 chip up to its maximum 100 Specmark potential within the next year or two.

The Interpro, Interact and Interview workstations range in price from \$18,500 to more than \$100,000. "At first blush, they look pricey, but that's only because the Intergraph workstations come complete in usable color configurations," Fouldyler noted. The Interpro 6450 32-D workstation, for example, costs \$24,900 with a similarly configured IBM Presentation 520 workstation \$31,112.

At James M. Montgomery Consulting Engineers, Inc., a 100-mile Lake City, a dozen new Intergraph systems are already on their way, said Kelly Stevens, a server and network engineer in the CAD department. The engineering firm, with more than 36 offices worldwide, has about 100 Intergraph workstations and servers. "They're really needed to get the performance level of these machines back up to par with the industry, and there is a lot of

Catch-up time

Intergraph hopes its Series 6400 and other new processors will put it on more equal footing with IBM, DEC and HP.

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| | \$34,900 | \$34,310 | \$31,813 | \$31,380 |

Source: Intergraph

room for growth in this C400 architecture," Stevens said.

He added that his firm never considered abandoning the Intergraph platform for higher-performance competitors. "It's

not just the price/performance that matters to us," Stevens noted. "It's also the integrated software with the platform, and Intergraph is far above the other vendors there."

TI's Unix CASE plan targets commercial users

BY KIM S. NASH
CW STAFF

Texas Instruments, Inc. last week joined rivals in the integrated-CASE market by announcing plans to port its application development workbench to Unix-based hardware. But so far, integrated computer-aided software engineering (I-CASE) tools for building business—not scientific—software on Unix may be seen as products in search of a market.

In recent joint announcements with Hewlett-Packard Co. and with IBM at Uniforum last week, TI gave more specifics than other commercial I-CASE firms about its Unix plans.

“TI said it will start reselling IBM’s RISC System/6000 workstations this year, bundled with TI’s Information Engineering Facility (IEF).

The HP deal calls for IEF for the HP 9000 to roll out in several phases, starting with an implementation tool set in 1992’s first quarter. It will control coupling and linking of programs generated by TI’s MVS- and OS/2-based

construction tools.

By promising products for Unix, mainstream commercial CASE vendors are making a play for users who are downsizing mainframe programs to open platforms. But users do not care much right now, said Ed Aclay, director of software strategies at

Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

In the commercial world, “people are busy worrying about moving to Unix boxes, [and are] not interested in doing all-out development for them yet,” Aclay said. He noted the dichotomy in

Unix development: business applications vs. “techie” real-time Unix engineering. I-CASE vendors are shooting for the first set, while smaller firms cater to the scientific set, he said.

Tools such as the C Development Environment from Integrated Development Environ-

ments, Inc. (IDE) and Teamwork from Cadre Technologies, Inc. are targeted more toward scientific than business users, Aclay said.

However, IDE is trying to change that perception through a deal with IBM to integrate one of its products. Software Through Pictures, with IBM’s new AIX Software Development Environment Workbench/6000,

Storage Tek extends focus

CONTINUED FROM PAGE 29

store 100 times more data than current 200M byte cartridges; Powderhorn, a 1993 field upgrade from the first generation of ATLs; Timberwolf, a 1993 low-cost ATL with only 500 to 1,000 cartridges; and Timberline, a 1993 cartridge subsystem with 36 tracks—double the current number.

“Selling the next 3,700 tape libraries will be far more difficult than selling the first 3,700,” Calvery noted.

So far, Storage Tek has stayed off IBM by picking an area in which IBM had no product offering and marketing it aggressively to IBM’s mainframe users. IBM was stung by each Storage Tek library displacing dozens of IBM 3480 tape cartridge drives. There have been signs that IBM’s Storage Products Division in San Jose, Calif., may respond by marketing its own tape library, analysts said.

Industry analysts said they believe that Storage Tek wants to grow by identifying more storage product niches untouched by IBM.

“First, they went after the really large data centers,” said Karen Landis, a senior analyst at Computer Intelligence/Infocorp, which tracks Storage Tek’s installed base. “Now, they’re really going after machines like the AS/400, which may not even be in the central data center.”



Retailers seek high-tech profit boost

IS pros at retailer's convention see technology as crucial to real growth

BY SALLY CUSACK
CW STAFF

NEW YORK — Information technology can play an important role for retailers as their companies seek to improve cus-

tomer service, enhance store performance and lower operating costs during these difficult economic times.

Information systems professionals throughout the U.S. gathered here earlier this month

to share information at the annual National Retail Federation convention.

According to Carl Steidtmann, chief economist and vice president of Management Horizons, a division of Price Water-

house, the combination of low inflation and stagnant real growth means margins will shrink. Profits will come only to those retailers that can grow inventory, space and labor productivity, Steidtmann said.

Large retailers agreed with the prognosis, and many are looking for high-tech solutions to these problems (see story page 77).

"It is our vision to develop and customize our systems to provide a competitive weapon via technology," said Charles Braddy, vice president of MIS at Victoria's Secret. The lingerie manufacturer uses Digital Equipment Corp. VAX/VMS systems and plans to draw from the "best thinking of all our people across all departments in developing a centralized integrated approach to designing systems," Braddy said.

Another vice president of IS in the apparel industry said she was shopping at the conference for a systems solution to replace her company's aging proprietary mainframe platform. Hardware and software vendors were on hand to demonstrate and display everything from point-of-sale (POS) to security systems.

Among them, Fujitsu Systems of America and Hewlett-Packard Co. announced a joint agreement to provide store-level, Unix-based POS systems. Under the alliance, Fujitsu will integrate HP's 9000 Series 800 in-store processor with the Fujitsu POS products. This open systems approach lets retailers install a customized in-store system capable of integrating a host via either Fujitsu or HP networks.

HP's Openware reduced instruction set computing (RISC)-based environment is currently being used by Wal-Mart Stores, Inc., The Home Depot, Inc. and Strawbridge & Clothier.

Thomas Ritenhouse, vice president and controller at Strawbridge & Clothier, said the company decided about a year ago to standardize on open systems platforms. They are replacing older IBM Series/1 computers with HP Unix-based servers.

Additional news

Other introductions at the show included the following:

- Symbol Technologies, Inc., based in Bohemia, N.Y., unveiled a prototype for a portable POS device for wireless, mobile transactions throughout the retail store. The portable POS device is anticipated for delivery in the third quarter.

- Checkpoint Systems, Inc., in Thorold, N.J., introduced a personal computer system with remote dial-in capabilities. The system is designed to prevent both internal and external pilferage of retail goods.

- STS Systems, a Montreal retail software provider, demonstrated a prototype executive information system running on Intel Corp. 80386-based Microsoft Corp. Windows environments. The customizable system is geared to nonexecutive, nontechnical end users and will allow executives and departmental managers to access and manipulate financial, inventory and other data from a variety of sources.

The software program will be available later this year.

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Users eye new functions in Sequent systems

BY JEAN S. BOZMAN
CP STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc., trying to push aside the news of its 20% work-force cut late last year, last week upgraded its flagship line of Symmetry computers with microprocessors based on 50-MHz Intel 43040 chip. The enhanced computers are intended to serve two purposes for Unix users: to be host computers for large personal computer local-area networks and to be warehouses for relational database management systems.

The new Symmetry 2000 series Models 250, 450 and 750 — shipped to a small group of customers in December and January — are being made generally available this month. There can be a maximum of six 486 processors in the Model 250, up to 10 processors in the 450 and up to

30 processors in the 750. Prices for the new models range from \$50,000 for an entry-level Model 250 to \$2.5 million for a high-end Model 750.

At the same time, Sequent boosted I/O rates by announcing a special four-channel disk-drive controller that supports four separate 10MB drives per channel. Using such controllers on the Model 750, users can address 260GB bytes of storage memory, Sequent said.

One early user, Awest! Express, Inc. in Coeur d'Alene, Idaho, plans to have one Model 750 act as a dedicated database server and another host PC applications for the trucking firm's 50 branch offices.

"This is our first open systems purchase," said Dave Ballance, director of computer resources at Awest!. "It will ultimately replace our older Prime system that we have had for many years. The firm plans to run the new Sequent machines in parallel with the Prime Computer, Inc. computers for many months while applications are converted to Unix, he said.

The four-channel controller will allow continuous processing, even if one disk drive fails, — a feature that could prove important to large commercial sites. "A disk replacement is probably the No. 1 item that would cause you to interrupt

processing," noted Mark Chandler, a software designer at Axis, Inc. who worked on a Sequent Model 700 for the Seattle municipal courts system. "Now, you can pull out some of the disk drives without stopping the machine."

Some industry analysts view Sequent's processor upgrade as a way to differentiate its products from those of other Unix platform vendors. "The success of Sequent and of Pyramid has attracted the attention of Unix mini-vendors who want to move upscale," said William Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

To anchor massive PC LANs better, Bluestein said, Sequent last year adopted Novell, Inc.'s Netware for use on its multiple Intel processors.

NEW PRODUCTS

Unix software

Magic Software Enterprises, Inc. has ported its Magic line of applications development tools to the Unix operating system. The software tools provide a menu and table-driven environment for developing programs without writing code. The Unix version is compatible with the DOS version, allowing personal computer applications to be ported transparently to Unix systems.

Regular prices start at \$1,500.
Magic Software Enterprises
1200 Main St.
Irvine, Calif. 92714
(714) 250-1718

Development tools

Britz Publishing, Inc. has released UnixIndex, an indexing system for midrange computers.

Unidx creates programs for on-line data file searches. It asks the user for a description of each file along with search keys and fields to be displayed. The software then generates and compiles search programs in RPG-II source code. No programming is required on the part of the user, the company said.

A permanent license costs \$99.
Britz Publishing
Suite 1A
986 Madison Ave.
Madison, Miss. 39110
(601) 853-1394

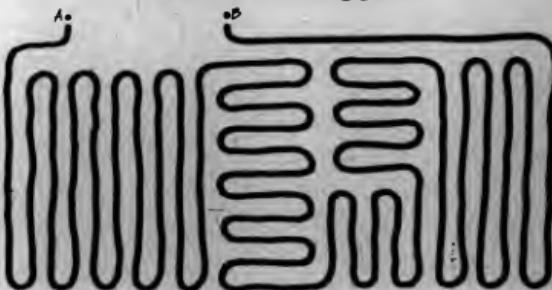
Applications packages

Halberstadt & Co. recently announced availability of Release 3.0 of its Equipment Manager System/400 vehicle maintenance management software.

The software runs on IBM Application System/400s and allows users to track equipment repair history, along with parts inventory, preventive scheduling and worker productivity.

It costs \$10,000 to \$20,000, depending on the AS/400 model.
Halberstadt
Suite 136
1 Woodlawn Green
Charlotte, N.C. 28217
(704) 527-7940

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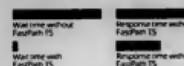
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Kim Myhr, Senior V.P.
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Client/Server: Direction of the '90s
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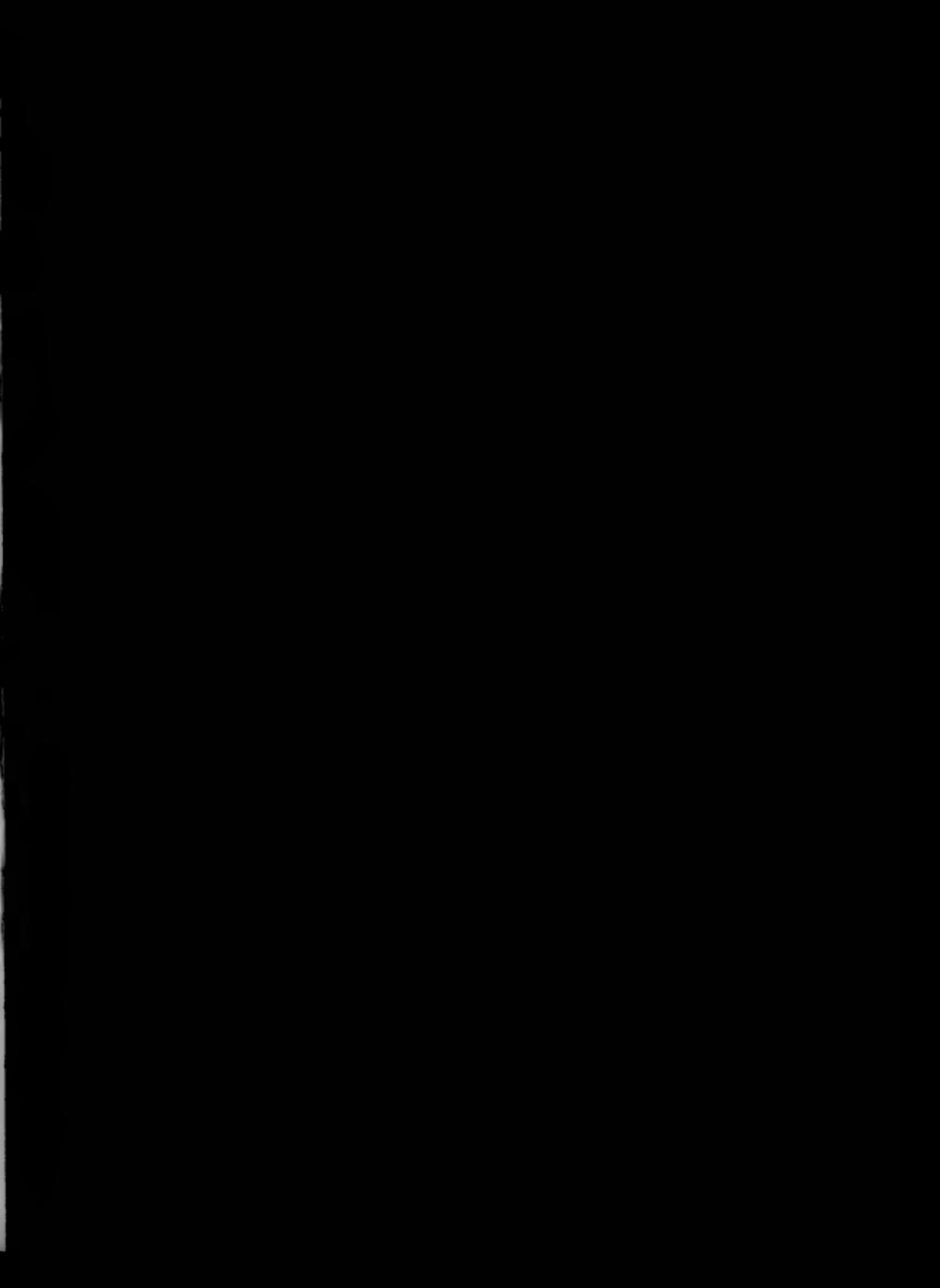


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INTERNATIONAL DATA CORPORATION

White Paper

uniVerse: DELIVERING A MATURE
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uniVerse: DELIVERING A MATURE Unix APPLICATIONS ENVIRONMENT

Introduction

Unix, in its many guises and ever-changing forms, is a complex technology for even the most skilled Information Systems (IS) department. At a time when IS budgets and payrolls are shrinking, mastering Unix becomes even more difficult. And just as there is no denying the complexity of Unix, there is also no denying its staying power.

One way to harness that power while taking advantage of existing systems is to implement uniVerse, a native Unix application development environment which enables software developed in the Pick environment to work on any Unix system. uniVerse users can use their existing software or choose from a suite of 4,000 other mature applications.

uniVerse also offers a conducive environment for developing new Unix-based applications. It includes a three-dimensional database file structure, data dictionary and query language. In its native Unix environment, it allows developers to take advantage of Unix features, including the full range of software tools, communication options and front-end technologies.

Despite its strengths, uniVerse still faces some obstacles. Like Pick, it suffers from a lack of name recognition. It also needs to reach new markets. VMark Software, Inc., which produces uniVerse, must continue its largely successful efforts to market to VARs and systems integrators while stimulating applications development from new sources.

Succeeding in an open systems IS environment is another challenge for VMark. So far it has implemented in uniVerse such standards as Posix, Motif, X and TCP/IP. In order to fully enable connectivity with other heterogeneous databases, the company is actively implementing appropriate standards specified by the SQL Access Group.

uniVerse is currently at a crossroads. VMark expects continued growth in its traditional business and if uniVerse is thoughtfully developed to meet a wider range of user needs, it will be a productive partner of Unix for the long term.

was written independently of the Computerworld editorial department by
International Data Corporation.

For more information on the content of this White Paper or for information on
International Data Corporation, please call 508-672-8200.

IDC White Paper





uniVerse: DELIVERING A MATURE Unix APPLICATIONS ENVIRONMENT

THE RESULTS OF A RECENT INTERNATIONAL DATA CORP. (IDC) SURVEY OF 249 MULTI-USER COMPUTER SYSTEM SITES REVEALS THAT 80 PERCENT OF THOSE SITES WILL ACQUIRE ONE OR MORE ADDITIONAL MULTI-USER SYSTEMS WITHIN THE NEXT THREE YEARS. FURTHERMORE, 59 PERCENT INDICATE THEY WILL BE OFFLOADING APPLICATIONS

FROM THEIR CURRENT SYSTEMS TO THESE NEW MULTI-USER SYSTEMS.* ■

NOT SURPRISINGLY, Unix IS IN A POSITION TO FLOURISH IN THIS DYNAMIC COMPUTING ENVIRONMENT. ALMOST HALF (46 PERCENT) OF THE SITES SURVEYED BY IDC SAY THEY ARE CONSIDERING Unix TO SOME DEGREE. USERS WHO WISH TO REALIZE THE BENEFITS OF

Unix SYSTEMS AND A MATURE SUITE OF APPLICATIONS MAY DO WELL IN CONSIDERING uniVerse, A NATIVE IMPLEMENTATION OF THE PICK ENVIRONMENT IN Unix. ■ THE PICK ENVIRONMENT HAS BEEN REGARDED BY A KNOWLEDGEABLE FEW FOR OVER 20 YEARS AS AN EFFICIENT PLATFORM FOR DEVELOPING AND DEPLOYING APPLICATIONS THAT

* TWO HUNDRED OF THE 249 SITES INDICATE THEY WILL BE EITHER ACQUIRING NEW MULTI-USER SYSTEMS OR UPGRADING EXISTING SYSTEMS. THE 50 SITES GOING TO NEW MULTI-USER SYSTEMS THE 200 SITES CONSISTED OF TWO GROUPS OF 50 SITES CONSISTING OF IBM 5080/5090 AND DEC VAX 5000/9000 SENIOR SYSTEMS; AND FOUR GROUPS OF 25 SITES WITH WANG, UNISYS, PRIME AND DATA GENERAL SYSTEMS.

unfortunately ran on its own proprietary operating system. In following the growing acceptance of Unix in the commercial marketplace, VMark Software, Inc., of Natick, Mass., has taken Pick's application development and delivery environment and implemented it in Unix in the form of uniVerse.

Thus uniVerse is the product of merging the strengths of Pick — an integrated database/file manager, a data dictionary and a query language — with those of Unix, which has multi-vendor support across multiple platforms.

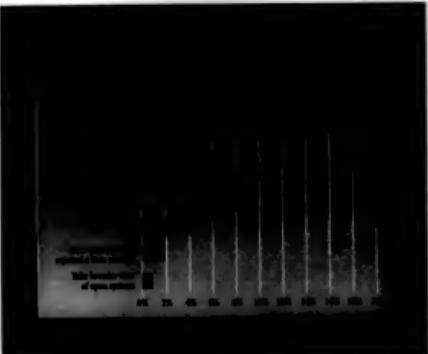
Why implement a native Unix version of Pick? Because Pick, like Unix, was developed over 20 years ago, and offers a mature environment with many available applications. Via its compatibility with Pick, uniVerse has access to over 4,000 applications developed exclusively for that environment. This allows VMark to focus its energies on offering the best possible product, an application design, development and delivery environment (AD^E), while other vendors with operating systems' expertise deliver the Unix operating system component.

What are the components that make up uniVerse and why is uniVerse a good AD^E? The major components of uniVerse include the following Pick-compatible elements: database, file manager, query language, command language, processor (i.e., shell), BASIC compiler and run-time environment, and distributed database support.

DATABASE AND FILE MANAGER

While VMark has implemented the Pick Application Programming Interface (API) for uniVerse, the database and file manager system is the cornerstone of uniVerse. The benefits of doing a complete emulation of the Pick file system on Unix are twofold. First, as far as the application and the developer are concerned, the file system has not changed. System data is still accessed in the same way. Second, because the files created by uniVerse are normal Unix files, standard utilities may access them and special disk partitions do not have to be created. Unix commands such as CP (copy), MV (move/rename), and TAR (tape archive) all work on uniVerse files. In addition, third-party backup and system administration utilities can work on uniVerse files.

In a business environment, the size of



Almost half (49%) of sites surveyed by IDC indicate an interest in acquiring Unix. Many of these sites are potential uniVerse users.

be stored as part of a vocabulary file.

COMMAND LANGUAGE AND PROCESSOR

The database and file manager is the heart of uniVerse, the command language and processor are the elements most visible to the users. If the system administrator wishes, uniVerse's command language may be as close to the user as ever gets. uniVerse's usefulness is further enhanced by its site-expandable command language that allows users to expand it to meet their individual needs.

The vocabulary (VOC) file is the key stone of the command language and processor. The VOC file contains descriptions of the verbs, key words and files that are available to the uniVerse user. The contents of the VOC file make up the command language. The command processor uses the VOC file to interpret each of the commands as they are entered by users. As is the case with Unix shells, VOC files allow users and/or system administrators to customize the environment. And, as is also the case with Unix's "aliasing" facility, the system administrator may add verbs that, in turn

uniVerse: DELIVERING A MATURE Unix APPLICATIONS ENVIRONMENT

represent a longer command string.

uniVerse also provides command histories. As with Unix, a predetermined number of instruction lines is maintained in a list. In the case of uniVerse, up to 99 instructional lines can be kept. In the uniVerse vocabulary, each line is a sentence and is stored in the VOC file. Users may then tie together a series of two or more sentences to make a paragraph which, in turn, is stored in the VOC file. Both sentences and paragraphs can be given nicknames. The nicknames are used to execute the actions within the sentence or paragraph. By starting with the smallest components of the command language, users can build a customized language within uniVerse that meets their unique needs.

PROGRAMMING LANGUAGE

BASIC is the primary programming language for the uniVerse system. However, uniVerse's BASIC is about as close to the interpreted BASIC language used for teaching as a Porsche is to a Model T. While there are some similarities, such as ease of use, uniVerse BASIC is designed for application development. The non-uniVerse BASIC is intended to be a teaching language and not to write commercial applications.

While uniVerse does provide an editor for developing BASIC programs, developers are free to use other editors. Experienced Unix developers will likely opt for VI or EMACS, though any editor that can read and write ASCII files is acceptable. uniVerse's use of ASCII files for programs permits developers to use both Unix and third-party application development utilities such as Source Code Control System (SCCS).

While VMark's BASIC is compiled, it is not compiled in the common sense of the word. Rather than producing executable binary files, the uniVerse BASIC compiler produces an intermediate token stream. It is this token stream that is executed by the BASIC environment. Because the token stream must be interpreted each time the program is executed, it is not as



EDC expects the trend of sites acquiring new multi-user systems and the acceptance of Unix to spur demand for uniVerse.

efficient as machine language. However, it is much more efficient than an interpreted environment. Once the program has been compiled, it may be executed with the familiar RUN command.

While the intermediate code is not true object code, uniVerse developers can treat it as such. A program may be catalogued with uniVerse. Catalogued programs are advantageous as they can be called from other code segments and they facilitate the reuse of the code segments.

DISTRIBUTED DATABASE SUPPORT

Information systems installations are distributing their databases across a multitude of platforms. Some sites have worked off of a carefully planned schedule. Other sites are forced into distributed environments as departmental and personal systems are added to their networks. As a result, many users do not know or care where their data physically resides. Their overriding concern is that they be able to transparently access the data when they

uVnet is uniVerse's distributed database access scheme. This optional product, using the de facto standard Transmission Control Protocol/Internet Protocol (TCP/IP), permits easy access to data that

may be distributed over multiple systems running uniVerse.

VMark has simplified the process of communicating with remote file systems by eliminating the need to provide the full address and file name each time a remote file link is established. A user may insert an entry, which serves as a nickname to the remote file, into the VOC file. Once the VOC file entry is created, the user may refer to the nickname through both command line entries and BASIC programs.

uniVerse's FUTURE

The sites responding to IDC's survey say they do not rely heavily upon VARs and external consultants, which are the leading distribution channels for uniVerse. This is not necessarily bad news for VMark. While the company has its share of large system sites, it is not primarily targeting large firms with internal programming expertise. Instead, it chooses to deliver turnkey software solutions to small-to-medium user sites that lack the ability to write or rewrite programs internally. Clearly, less customized, packaged software solutions based on the more than 4,000 commercially available Pick applications are VMark's mainstay.

VMark must remain extremely aggressive in its efforts to induce Pick developers to port their products to uniVerse. Actually, many uniVerse sites indicate that "port" may be the wrong word in migrating Pick applications to uniVerse. Rather than recounting horror stories of multiple-month or even multiple-year porting periods, many user sites talk of overnight and weekend changeovers.

As Pick sites weigh alternatives to their current Pick environments, Pick/Unix combinations are being considered along with relational database management systems or object-oriented databases. In order to keep their current customers, software houses with Pick applications should support uniVerse.

The port to uniVerse is a "win-win" situation for both software houses and their customers. For the software houses,

IDC White Paper



The unVerse function provides software to communicate with unVerse databases on other systems.

uniVerse-based products are easily moved from one Unix system to another and they are compatible with a wide range of systems. This compatibility is also an advantage for buyers who may move applications from system to system as hardware platforms change.

In addition to being an application delivery platform, uniVerse is also an application design and development platform. This bodes well for uniVerse, as the IDC survey finds that just under half of the surveyed sites develop their own application software internally.

CASE STUDY: A.M. MILLER

When Bruce Bachman came to A.M. Miller and Associates, Inc., a credit and collection firm, just over a year ago, it was obvious to him that the current Pick software running on a proprietary platform was inadequate and running out of capacity. The situation was so bad that the firm was on the verge of turning away business.

A.M. Miller had been using a Pick Environment for over seven years. According to Bachman, the firm wrote its own accounting and tracking software and was determined to protect that investment. As soon as the decision was made

to migrate to a new hardware platform, A.M. Miller chose Unix because it was "universal".

As a Pick user, the firm needed a Pick-compatible software system that ran on top of Unix. After an evaluation of different Pick emulators, Bachman selected what he considered to be the best of the Unix-Pick environments, VMark's uniVerse was implemented in conjunction with Strategic Alternatives, Inc., a Detroit-based VMark distributor. It was implemented on a new DECSystem-5500 running Ultrix.

"We had an overnight conversion," states Bachman. Before that happened, however, he and his staff wisely did a dry run to detect problems. Problems were found. They consisted of differences in syntax between their old Pick system and uniVerse. Once the differences in the syntax were detected, his staff reprogrammed source code and the problems were resolved. What became the overnight conversion could then be done. "We didn't lose a day of business," Bachman declares.

At last count, A.M. Miller is supporting 205 concurrent users on its uniVerse/DEC System. A.M. Miller's business hours run from 7:00 a.m. to 11:00 p.m., with peak

demand coming in the late afternoon. In spite of the heavy loads placed on it, the uniVerse/DECsystem remains stable.

Bachman's staff of nine includes three programmers who are responsible for new development and maintenance. Bachman says that, despite beliefs that experienced Pick/uniVerse programmers are hard to find, he has not had a problem finding them.

Bachman's approach to uniVerse and Unix has been a fairly traditional play on the strengths of both components. He uses uniVerse as a platform for both application development and delivery. Unix is employed for client access and system management. Bachman says that A.M. Miller also recently linked an Ethernet with six PCs to its DECsystem.

CASE STUDY: OCEAN COUNTY LIBRARY

The Ocean County Library, based in Toms River, N.J., is typical of organizations that are completely dependent on VARs and systems integrators for their systems. The library's David Slater indicates that his institution's Hewlett-Packard 9000/857 supports 230 users. Regarding uniVerse and Unix, he says he is happy to realize the benefits of both without having to access the inner workings of either.

Ocean County Library is in an enviable position. It is able to rely on one vendor, Dynix, Inc., to provide software that, when written on top of uniVerse, permits ease of use for over 200 users. Dynix is solely focused on turnkey applications for libraries. Using this uniVerse/Dynix solution, the library is not forced to develop costly internal expertise.

SUPPORT FOR CRITICAL COMPONENTS

uniVerse has many of the capabilities sites surveyed by IDC rate as either critical or highly desirable. Survey respondents say the three leading requirements for application development environments are: a query language (63 percent), connectivity to other databases (57 percent) and distributed databases (44 percent).

uniVerse meets that first requirement with RETRIEVE. However, while uniVerse does offer database connectivity via uNest, it is currently only across different Unix platforms.

IDC believes that some corporate



mainframes, be they small-scale systems supporting 12 users or large-scale systems supporting over 200 users, must continue to act as database servers in addition to performing their other duties. This change, combined with the increasing amounts of data on remote systems will drive the demand for database connectivity through at least the mid-90s.

VMark understands that this connectivity will require it to offer a standardized Structured Query Language (SQL), as well as give the uniVerse-based system the ability to participate as a member of a heterogeneous network. To this end VMark is following the lead of the SQL Access Group, which was formed to address compliance with the group's standards, as they become available.

A major strength of uniVerse is in its ability to promote the development and delivery of vertical applications in an effective and timely manner. This has been the case since the inception of uniVerse, and its strength in this area has recently been enhanced by the implementation of user-oriented features such as the Motif-style graphical user interface capability for PC look and feel, transaction logging and recovery for data integrity, and distributed database capability for today's ever-broadening topologies. These features serve to contemporize what uniVerse (and before that, Pick) solution providers have done' successfully for a long time. These people bring to the user the ability to tailor their software to operate consistently with business requirements rather than the reverse. Most of VMark's 150 VARs have either a vertical or functional (such as systems integration) specialty. As uniVerse continues to move into open systems and embraces these standards, this customer-oriented expertise will be focused squarely on the open systems user.

One of the common beliefs regarding Pick-like systems is that it is difficult to find developers that are familiar with the environment. As a native Unix application, uniVerse has skirted this issue because developers work with Unix, not Pick, and if when they need to access the



uniVerse includes a standard query language and optional distributed database capabilities.

operating system.

VMark proposes using Computer-Aided Software Engineering (CASE) tools to generate applications. However, if this is the plan, VMark must be able to provide methodologies that are accepted across a wide variety of platforms, be they databases or operating systems.

IDC believes VMark's support of SoftBench technology as developed by Hewlett-Packard is correct. SoftBench technology allows users to pick and choose SoftBench-compliant products from various vendors to assemble a CASE environment that meets their specific requirements. IDC believes that established CASE vendors with SoftBench-compliant products, such as Interactive Development Environments and Cadre, would be appropriate partners for VMark to establish relationships with. SoftBench technology is available or announced on HP, Sun and IBM Unix platforms and is expected to be announced for other platforms this year.

SUMMARY

IDC believes that uniVerse is posi-

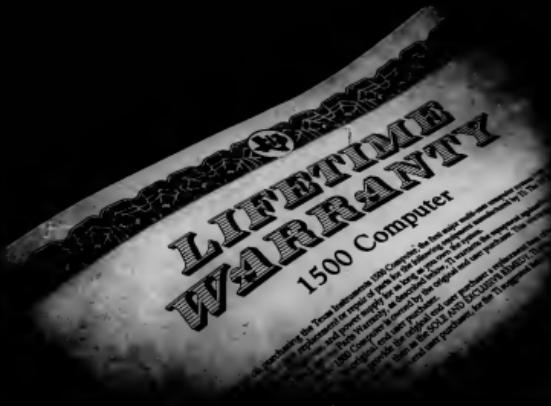
tioned to play a meaningful role in the ever-expanding Unix market. Users that are looking for turnkey applications are well advised to consider a uniVerse-based application. Considering the fact that some Pick-based programs that can run on uniVerse have been evolving for over 15 years, it would be hard to find such mature and functional applications elsewhere.

Despite its advantages, however, uniVerse still faces some challenges. VMark must persuade VARs, IS software developers and potential users that uniVerse has staying power and will continue to evolve along with Unix. In order to stimulate ongoing application development, VMark must educate them regarding uniVerse capabilities in the open system environment.

VMark must employ three strategies. First, it must continue to successfully cultivate the developers of the more than 4,000 Pick applications. These people should be encouraged to keep porting to uniVerse, and to actively update their software by implementing the latest technology that Unix has to offer. This will keep the company's pipeline of mature solutions evolving and flowing.

Secondly, in order to cultivate new solutions, VMark must realize that not the whole world will speak uniVerse. It would not be practical to support all of the various dialects of SQL at this time. VMark is correct in taking direction from the SQL Access Group.

Finally, VMark should align with one or more major third-party CASE vendors. This will bring the prestige of these vendors into the equation, and produce faster and easier transitions for first-time uniVerse developers.



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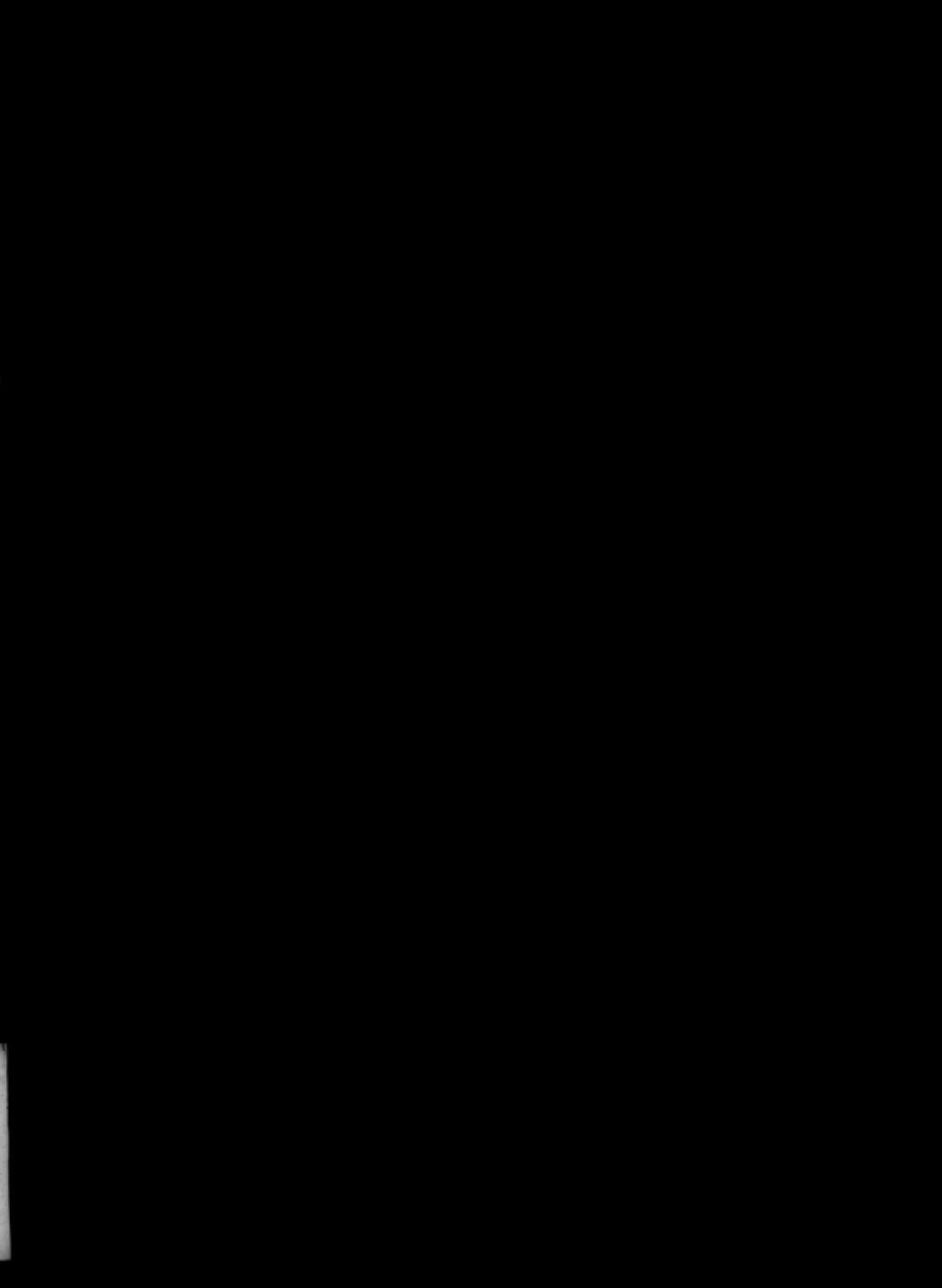
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PCs & WORKSTATIONS

New HP boxes expand options

ANALYSIS

BY MARYFRAN JOHNSON
CWT STAFF

When Hewlett-Packard Co. crashed the party two weeks ago with a pair of top-speed, low-end HP 9000 Series 700 workstations, the vendor did more than drop a few hot Unix boxes into that \$5,000 to \$10,000 "sweet spot" in the market.

More significantly, HP broadened user options with its accelerated push to pair up its line of X terminals with the high-performance Series 700 workstations. Last week, HP added key networking features to its X sta-

tion server software to enhance support for remote work groups, improve network security and open the terminals to a broader range of input devices.

Sets X expert

Analysts said this strong emphasis on X terminals gives HP an important differentiator in the market share battles with Sun Microsystems, Inc., IBM and Digital Equipment Corp.

"Most of the workstation vendors would tell you otherwise, but the world really does want X terminals," said Robert Herwick, an analyst at Hambrécht & Quist, Inc. in San Francisco. "When a large organiza-

tion is populating hundreds or thousands of desktops, or a difference of a couple thousand per desktop makes a big difference."

X terminals (or X stations) are diskless, intelligent terminals designed to run X Window System software, allowing users to access and view applications that run on client workstations. The notion of mixing X terminals into workstation networks is an increasingly interesting option to many users, particularly those with excess workstation capacity and battened-down budgets.

"Many people bought more power than they need, so a number of workstations out there are underutilized, and that power is

achieved by the major workstation vendors has forged a different strategy when it comes to selling X terminals. • HP closely links its 700/RX line with its Unix-based Series 700 workstations, offering customers "two-seater" and "multiseater" deals, configuration testing results and specialized networking software.

• DEC pushes its line of X terminals as alternatives to ASCII and graphics terminals.

- IBM sells a majority of its X terminals to customers buying midrange or high-end RISC System/6000s, handing them off to the RS/6000s more like terminals of a minicomputer.
- Sun, the one vendor without its own line of X terminals, rejects X terminals and encourages users to buy low-end workstations instead.

available," said Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass.

Northrop Corp.'s information services center in Hawthorne, Calif., is now installing nearly 300 HP 700/RX terminals. The aerospace and defense contractor decided that while mechanical engineers may need full-function workstations, "about 80% to 85% of the other workstations could be the X terminal variety," said Harold Hickman, director of distributed operations.

"We started getting the notion that since most of our activities didn't need full capabilities, X terminals should be the way we did it in the future," Hickman explained.

Still, X terminals do raise a number of concerns about their impact on client workstation performance, network traffic and system management.

"We're trying to understand, as a commercial user, what X terminals would really mean to us and our applications," said Barbara Kostanich, MIS director of Consumer Health Services, Inc. in Boulder, Colo.

Continued on page 54

Harvard Graphics faces fight in Windows market

BY CAROL HILDEBRAND
CW STAFF

As the presentation software market grows crowded with a host of feature-rich products, one thing has become clear: It isn't the product that's the driving force behind what's making users want to buy. And SPC is spoiling for a fight.

Software Publishing Corp., whose Harvard Graphics presentation package rules the DOS market, was one of the last onto the field with a Windows-based product, announced late last year. Now it faces some heavyweights in its quest for a large

share of the Windows market.

"There's not enough growth to accommodate everyone. [The market] is getting to be pretty saturated at this level," noted Bill Campbell, president of New Media Research, Inc. in Los Altos, Calif. "It's more of a marketing game than a features game." For example, such tactics as Microsoft's bundling of PowerPoint, Excel and Word into one Office package is garnering Powerpoint, a substantial user base, he said.

"It's first and foremost a slugging fest, and we are going to give no quarter," said Fred Gibbons, SPC's president and chief execu-



Harvard Graphics for Windows offers a slide writer and enhanced presentation as well as more standard features

tive officer. Gibbons said he is confident that having beat out the likes of Lotus Development Corp., Freelance and Microsoft

Corp.'s PowerPoint in the DOS arena, the company can do it again with Windows. Gibbons

Continued on page 60

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SOLUTIONS WORLDWIDE

Autoclerk PC kiosks enlisted as LA's very own 'robocop' team

BY JIM NASH
CW STAFF

LOS ANGELES — Leave it to Southern California to mix networking with equal parts Judge Wexner and Max Headroom, two unique video icons born here in the 1980s.

Next month, the county of Los Angeles expects to introduce Autoclerk, a system that uses personal computers manned by a recorded human face to process traffic and parking-ticket transactions.

As part of a one-year pilot, two royal-blue, 7-ft kiosks stand outside the Long Beach Municipal Courthouse will coach accused scofflaws through the process of pleading guilty and paying their fines or scheduling court dates. The project began in February 1991.

Minus the bored stare usually

given by a clerk while the accused fumbles for an alibi, "Autoclerk can do anything a human clerk can do," said Jim Weaver, L.A. County court administrator. It will accept Visa payments, bank debit cards and personal checks, make court appointments, explain the rationale behind bail amounts and even tutor people on the ins and outs of small-claims court.

Efficiency needed

Weaver said the county needed a system to make traffic court more efficient. L.A. County issues 90,000 to 100,000 citations for moving violations each year, in addition to 25,000 parking tickets. Active citations can be as old as eight months.

As far as Weaver knows, Autoclerk is the only system of its kind in the nation. It consists of an IBM Personal System/2 Mod-

el 70 with 2MB bytes of random-access memory emulating sessions with an on-line IBM Application System/400 Model D75 at the courthouse and an IBM 3090 at the county's data center in Downey. Each kiosk holds a small printer for receipts, a keypad, a depositary and a credit-card reader.

What truly sets it apart from other remote-access computers, however, is Victor, the color image of an actor who takes graphical user interfaces one step further.

"He's the guy behind the counter," said Pat Kennedy, vice president of software development at multimedia hardware



The face that greets accused traffic violators and others at the Long Beach courthouse soon won't be Weaver's

and software maker North Communications, Inc., in Santa Monica, Calif., which built the kiosk system under a \$360,000 contract.

The actor was videotaped answering every conceivable question someone could pose while navigating the computer system or the traffic and small-claims courts. Victor's image is stored on a Pioneer 8000 laser disc player tucked away in the 800-pound, bulletproof kiosk. A touch screen will be installed to the left of the keypad.

Paid for by taxes, the system allows people to access the county's 3090 mainframe traffic and parking-violation database, which holds information from each of the 24 municipal courts in the county.

The AS/400's primary role is to run software that calculates bail amounts and another application that schedules court appearances. It can also act as a holding tank for transactions when the 3090 connection is interrupted for some reason.

BT North America, Inc., is providing the software that links the county's computers and the

credit card networks run by BT's value-added network, BT Typhoon. As with any other credit card transaction the firms facilitate, BT tracks and records all traffic around the network.

Due process

The system will prompt neophytes as they try to determine what they owe on a ticket, and it will explain how the fine amount was set. For example, Kennedy said, Victor might say that a ticket for speeding and a faulty headlight costs \$100. That amount would fall if the user can deposit, in the kiosk, proof that the headlight has been fixed. Once the deposit has been picked up by a person, the database record reflects the transaction.

"The virtue of Autoclerk is that you don't have to give up your options" in order to take care of a violation, he said. "You don't have to meet our schedule to due process."

Weaver, who said he is confident of success, is already planning further services for the system, including sale of birth certificates and actual filing of small-claims suits.

PC & WORKSTATION SHORTS

Adobe founders win Macintosh award

Adobe Systems, Inc., co-founders Charles M. Geschke and John E. Warnock were named winners of *Macuser 1991*. John J. Anderson Distinctive Achievement Award, which honors enduring individual achievement in the Apple Computer, Inc., Macintosh industry. The 1991 *Macuser* Rising Star award went to Randy Uhlios, a programmer who wrote the first version of a digital video software program, now known as Premiere, that Adobe markets. The awards are named for the two *Macuser* editors who perished in the 1989 Loma Prieta earthquake.

The mass-market distribution channel recently got another convert as Zenith Data Systems announced a new family of personal

computers aimed at that market. The boxes — which come bundled with DOS, Microsoft Corp.'s Windows, Spinaker Software Corp.'s PFS:Windowsworks and the Prodigy service — range from a 20-MHz Intel Corp. 80386SX-based notebook with a 60-MHz hard drive to four desktop PCs that start at a 16-MHz 386SX-based model and top out at a 25-MHz 486SX box with a 120-MB byte hard drive. The line of products is expected to hit the shelves in April.

Symantec Corp. has updated the Norton Antivirus program with a new application that finds and repairs more than 1,000 DOS- and Windows-related viruses and strains. Version 2.0 sells for \$129.

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SPF/2 takes full advantage of the 32-bit protected mode available in DOS running on an 80386 and the native protected mode offered by OS/2. If you have an 80386 or higher machine with at least 2MB of memory, you can use SPF/2. It's also fully compatible with Windows and Presentation Manager.

Here is just a sample of some of the features you will find in SPF/2.

Quarterdeck explains Desqview/X delay

BY CHRISTOPHER LINQUIST
OF STAFF

SANTA MONICA, Calif. — First announced in May 1990 for shipment that fall, Quarterdeck Office Systems, Inc.'s X Window System version of its popular Desqview multitasking software has yet to materialize. However, company President Therese Myers now says the product will ship sometime in the first quarter of 1992.

Myers, a Quarterdeck co-founder, said the delays were related to additional developer requests, including ease of use.

Quarterdeck first released a technical specification for Desqview/X in August 1990. Recent demonstrations of the system at trade shows, as well as agreements with Adobe Systems, Inc. for font technology and Rational Systems, Inc. for a DOS extender — both of which are to be integrated into the X-based product — seem to indicate that Desqview/X is still moving ahead.

Myers said the delays resulted from an effort to keep developers interested in programming for the environment, which will allow both remote and local access to DOS and Unix X programs as well as pro-

vide a graphical user interface (GUI) for text-based Desqview.

The first delay, which prevented the fall 1990 release, resulted from the announcement of Release 4 of the Open Software Foundation's X standard. Desqview/X was based on Release 3 at that point.

"The perception was that Release 3 wasn't good enough," Myers said. "Release 4 came out and we had to re-port."

A summer 1991 ship date was missed while Quarterdeck waited for the release of Microsoft Corp.'s MS-DOS 5.0, which Myers said the company expected in

March. When MS-DOS 5.0 did not ship until June, the release was put on hold until the fall in order to provide developers with the built-in font, printing and DOS extender support that the Adobe and Rational teams would provide.

The fall date fell by the wayside as Quarterdeck developers attempted to resolve memory fragmentation.

All the decisions to move shipment dates were made with one thing in mind, Myers said: "We said, 'We get one shot at this thing as a developer environment. We aren't going to get a second shot.'"

Desqview users voiced mixed opinions on the welcome; the product will receive if and when it does ship.

Some users said they have no current use for the product. However, Rocky Graham, an engineering associate at Dolby Labs in San Francisco, said he hopes Desqview/X will make his life easier. "We have a mixture of machines I need to work on and have access to Desqview/X sounds like the ideal solution for me."

Other users appear to have given up. "We were interested in it," said Kent Curtis, manager of software at Four Pi Systems Corp., a maker of automated X-ray inspection equipment in San Diego. But "some of the features they [were to] have offered have been swept away by the Windows avalanche."

New HP boxes expand options

CONTINUED FROM PAGE 51

Consumer Health, which runs a nationwide service matching patients with doctors, has a large network of Sun servers and workstations to support 150 to 200 service representatives who handle 1 million calls annually at the Boulder headquarters.

"My users are all on ASCII terminals, with all our applications built with our own windowing interface. How are people really going to work in an X terminal environment?" Kostanick asked.

Although she is now considering a pilot project involving X terminals, she said vendors still fail to make a business case for the technology. "They're not doing a very good job of communicating with commercial customers," Kostanick said.

The X terminal technology, only a few years old, is maturing at a brisk clip, however. That was evident last week in San Francisco at Usenix, the Unix industry's largest trade show.

Several vendors are scrambling to introduce color terminals to their lines or bring out second-generation machines powered by reduced instruction set computing technology.

Athenix Corp. in Sunnyvale, Calif., for example, announced it was entering the X terminal market with new shared-controller technology. It planned to pitch its products to the mainstream commercial market.

This year promises to be a lucrative one for the X terminal market, said Stephen Auditors, president of the X Business Group in Pleasanton, Calif. X terminal revenue grew from \$358 million in 1991 to about \$1.6 billion the year before.

"The market has not grown as rapidly as anticipated," he acknowledged, "but it's starting to catch on in more traditional data processing environments."

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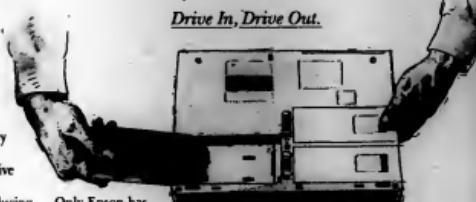
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Lotus 1-2-3/Mac: Intuitive, user-friendly

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weisz.

Lotus Development Corp.'s 1-2-3 for the Apple Computer, Inc. Macintosh makes a smooth transition to the Apple platform without compromising the functionality of the popular DOS version.

Ease of use: Visual tools such as movable palettes and customizable menus make 1-2-3/Macintosh more intuitive than the DOS package.

Performance: What it lacks in speed, 1-2-3/Macintosh makes up in compatibility. Users can import files from previous versions as well as those from Microsoft Corp.'s Excel. The package supports System 7.0.

Outputs: Charting features, drawing tools and graphics options are extensive, flexible and well thought out. There are true three-dimensional chart types; chart elements are treated as discrete objects.

Analysis: 1-2-3/Macintosh has basically the same analytical features as 1-2-3 Version 3.1 for DOS, including backsolver, the ability to edit within a cell and support for 3-D spreadsheets.

Value: 1-2-3/Macintosh (\$495) combines cross-platform mobility, strong analytical tools and solid performance into an easy-to-use and familiar package.

| Lotus 1-2-3 for Macintosh | | | | | | |
|---|------------------------|-----------------------|--------------------------|----------------|----------------------------------|-----------------------------------|
| Reviewers | Size of test | Performance | Output | Analysis | Value | Overall |
| Anderson 8/18/91 | | Long on compatibility | NC | Flexible tools | Inexpensive | Keeps its promise |
| Mac Week 12/17/91 | No translation process | NC | Has range of graph types | Good editing | Mac and PC users should consider | Supports Mac requirements |
| PC Week 12/5/91 | Seems effective | NC | Formatting features | Good analysis | NC | Has Mac's range for its money |
| User | | | | | | |
| Parkville State, National Computer Co. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Compatibility comes to the letter |
| David Adams, Astrata Marketing Corp. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Charting could be better |
| John Walker, NASA | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Has some unique features |
| Analysts | | | | | | |
| David Sommerville, National Software Testing Lab | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Very accessible interface |
| Richard E. Meyersoff, Meyersoff Computer Consultants | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Lacks some features but very nice |
| Power Products, Dongen, Inc. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | The large |

Key: ■ Very good ■ Good ■ Fair ■ Poor Response evaluations are excerpted from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

| Analysts | Long-term financials | | Short-term performance | |
|---|----------------------|------|------------------------|------|
| | 1991 | 1990 | 1991 | 1990 |
| Affiliated Tribes, Moore, Nagurni & Co. | ■■■ | ■■■ | ■■■ | ■■■ |
| Carlo Cansell, Gruyer & McNamee Capital Management | ■■■ | ■■■ | ■■■ | ■■■ |

Third-quarter results for Lotus were revenue of \$216.8 million, a 27% increase over 1990, and net income of \$2.5 million, a \$1.5 million increase over 1990's third-quarter income of \$4.6 million.

Lotus responds

Rob Adams, senior product manager:

Performance: 1-2-3 for the Mac's calculation time may seem slow, but it still takes less time to accomplish a complete task because the program is so intuitive to use.

Ease of use: We developed the 1-2-3 for the Mac interface by asking Mac users what they wanted. They didn't want a customizable icon palette.

Informix's Wingz: A fast but bumpy ride

Informix Software's Wingz 1.1A

| Reviewers | Size of test | Performance | Output | Analysis | Value | Overall |
|---|---------------------------|----------------|--------------------------|----------|-------|--------------------------------------|
| PC Week 9/27/91 | | Subpar | NC | Good | NC | Powerful, but less than the hype |
| Mac Week 9/27/91 | Multiplication capability | Powerful | NC | Good | NC | Wide range of capabilities |
| PC Magazine* 12/31/91 | NC | Among the best | Charting features shared | Good | NC | Shows promise |
| User | | | | | | |
| Mark Weber, Datamatrix Corp. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Powerful |
| Scott Trotter, Electronic Data Systems Corp. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Hyperscript makes life easier |
| Michael Zill, Matsushita, Inc. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | There's nothing close to Hyperscript |
| Analysts | | | | | | |
| Power Products, Dongen, Inc. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Good package that never caught on |
| Richard E. Meyersoff, Meyersoff Computer Consultants | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Good programming language |
| Douglas Research Corp. | ■■■ | ■■■ | ■■■ | ■■■ | ■■■ | Shows promise |

Key: ■ Very good ■ Good ■ Fair ■ Poor Response evaluations are excerpted from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. *PC Magazine rated DOS version.

Vendor financial information

Informix Software, based in Menlo Park, Calif., reported third-quarter 1991 revenue of \$40.7 million and net income of \$4.7 million. This compares with revenue of \$37.9 million and a loss of \$4.2 million for the same quarter in 1990. Financial analyst Charles Phillips at Soundview Financial Group rated the company's short-term performance as very good and its long-term stability as good. The company has been on the rebound, Phillips said.

Informix responds

Wings marketing manager:

Ease of use: Improving the user interface is a top priority for our next release. For instance, we plan to organize the menu better.

Analysis tools: We plan to add the tools offered by other spreadsheet packages, such as a solver. As for database operations, Wings can be used as a front end to the Informix database products.

Informix Software, Inc.'s Wingz for the Apple Computer, Inc. Macintosh may not be the easiest spreadsheet package to use, but its remarkable and robust combination of the powerful programming language and the Macintosh's interface make it an intriguing product.

Ease of use: Wingz' interface makes use of star icons and menu trees. Reviewers said the interface is not straightforward. Novices will appreciate the English-like syntax of the Hyperscript programming language for writing macros. Creating complex macros is a challenge.

Performance: Wingz' speed on the Macintosh is quite good. It is compatible with System 7.0.

Output: According to reviewers, Wings offers more charts and formatting choices than any other spreadsheet, enabling presentation-quality output. A drawback is that manipulating pieces of charts can be confusing.

Analysis: Spreadsheet auditing is not very powerful, reviewers said. There is support for matrix math and inversions as well as frequency distribution, regression and what-if table analysis. However, there is no solver or backsolver function. Data consolidation features and database operations are limited.

Value: Wingz (\$399) shines at charting and formatting, and its support for many hardware platforms is convenient.

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Show reveals pen computing ready for blast-off

BY MICHAEL FITZGERALD
CW STAFF

BALTIMORE — The question at the recent Pen Computer Users Conference was not if but when pen-based computing will take off.

Bruce Stephen, director of personal computer hardware and pricing research at International Data Corp. in Framingham, Mass., set the tone of the conference by saying in his presentation that it is only a matter of time before pen computing happens. Indeed, users of the nascent technology were there to discuss their projects, and the majority of the approxi-

mately 240 user attendees seemed eager to begin pilot projects of their own.

Two users of Grid Systems Corp.'s Gridpad described their projects to the conference. Both user projects focus on automating forms to improve data input in a field environment — what many expect will be typical examples of early pen-based computing applications.

At CSX Corp., a \$7 billion transportation company based in Dallas, a Gridpad pilot has been under way to collect data on truck deliveries, according to Dorothy J. Cranshaw, vice president of information technology. Cranshaw's group recently completed

its pilot and plans to purchase 400 Gridpads this year.

Cranshaw stressed a recurring theme at the conference: Users can have heavy influence on the systems being built, perhaps more influence than they have previously experienced. "It's very easy to work closely with a vendor on these types of projects," she said.

Brenda J. Taylor, director of test support at the U.S. Army's Electronic Proving Ground in Fort Huachuca, Ariz., outlined how Gridpads helped her group dramatically improve some data input tasks, including one project that went from requiring 18 people for a 36-hour

turnaround to needing three people for a one-to-two-hour turnaround.

Most analysts have said they do not see pen computers shipping in significant quantities until 1994.

Pen pilot planes

Numerous users spoke of their plans for pilot pen projects.

Roy A. Gregory, manager of personal computing at Scrivener, Inc., a privately held \$6 billion grocery wholesaler in Oklahoma City, said he would like to give pen-based systems to as many as 100 key board-phobic executives with heavy travel schedules for use as both personal time managers and information gathering tools.

Gregory said he would buy systems "today," if he could find one that met his needs. "It has to be based on a 386, and it has to look professional," he said. "Do you see executives carrying around plastic clipboards? No."

Gregory emphasized, however, that he was not frustrated by the lack of existing shipping products, largely because most vendors have been up-front about not being able to ship until the end of the first quarter.

Similarly, Michael Finnegan, project manager at Salomon Brothers, Inc., said the company wants to start a pilot in the second quarter that will tie pen-based systems into an imaging system the company is installing for its dealers. Salomon will use the pen systems for signature capture to decrease the amount of paper it uses.

Harvard faces Windows fight

CONTINUED FROM PAGE 51

said that an emphasis on OS/2 development caught SPC short on the Windows platform, but he did not think the product's tardy entrance will hurt it.

Harvard Graphics for Windows contains many of the features rapidly becoming standard for a Windows presentation product. Its slide sorter allows a user to view the entire presentation within one window and change the order of slides with a click of the mouse.

Fifty-four temples, which SPC calls Presentation Styles, let a would-be presenter pick one uniform style and carry it throughout the slide show.

Users can create presentations either textually or visually by choosing to work with the Outliner or the Slide Editor, respectively.

One interesting twist Harvard Graphics offers is the enhanced presentation quality. Through a feature called Launch Application, users can run DOS and Windows applications from within the screen show by clicking on a previously defined button.

Dynamic Data Exchange (DDE) links also let users create live data links to other Windows applications to ensure that the data in a presentation will be automatically updated whenever the source data is changed.

Mike McCurdy, an information specialist at British Petroleum International in Houston, said he was very impressed by the DDE links. "I was knocked out by it," he said. "I can really see us taking advantage of that."

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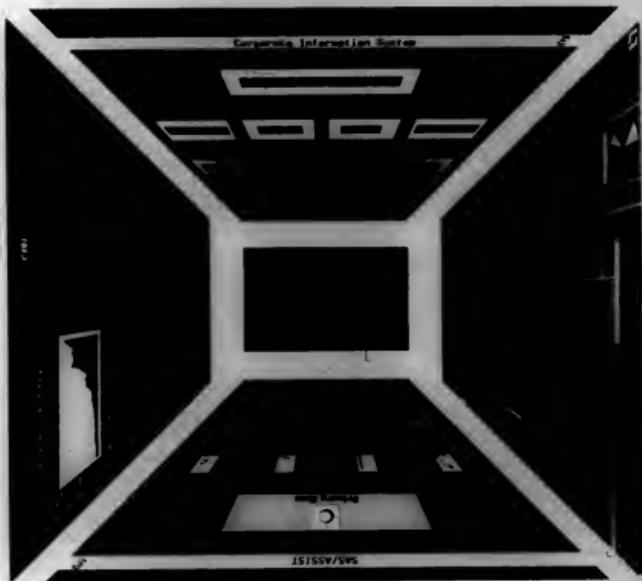
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New contenders announced in heavyweight portable division

BY MICHAEL FITZGERALD
OF STAFF

IRVINE, Calif. — Toshiba America Information Systems, Inc., the market leader in heavy portable systems, added power to and cut pounds from its product line last week, while Dolch Computer Systems began shipping its most powerful contender in the category.

Both companies promoted the emerging active-matrix color technology as an option.

Toshiba released four AC-powered portables, the T6400 and T6400SX lines, based on Intel Corp.'s 33-MHz 486DX or 25-MHz 486SX chip. Both come in active-matrix color and monochrome versions, with the color versions weighing 12.9 pounds and the monochrome, 11.7 pounds. Toshiba's current high-end products are the 17-pound T3200SX line (in monochrome and passive-matrix color versions) and the 14.7-pound T5200 and 16.9-pound T5200C (which features active-matrix color). Both of these systems use Intel 80386 processors.

Analysts said there is a market for the new products, despite the attention given to notebooks.

Bruce Stephen, director of personal computer hardware research at International Data Corp. (IDC) in Framingham, Mass., said the market for AC-powered portables would grow to 158,000 units in 1992, up from 143,000 units in 1991 and 134,000 in 1990 (IDC data shows that Toshiba sold 55,000 units in 1990).

"These are for someone who's slightly mobile, you might say — people who go to client sites maybe for a week at a time or only occasionally take their products home with them," Stephen said. He added that active-matrix color remains a high-end technology.

Toshiba will price the machines at \$5,699 for the T6400SX with gas plasma screen, \$8,499 for the T6400SX with active-matrix color (both systems have 4M bytes of random-access memory and a 120M-byte hard drive), \$6,999 for the T6400 with gas plasma screen and \$9,749 for the active-matrix T6400DX (both DX systems have 4M bytes of RAM



Toshiba's T6400DX sports 4M bytes of RAM and a 200M-byte hard drive

and a 200M-byte hard drive). Toshiba expects to ship in mid-February.

Toshiba also said these would be the last color portables it would ship this year. The company refused to comment on what other products it might offer, but sources close to the company predict that both 386- and 486-based battery-powered products, including one 486-based notebook, the T4400SC, will be delivered in November.

Dolch announced it is now shipping its P.A.C. 486-SOE, a 22-pound luggage-style unit based on Intel's 50-MHz 486 chip. An active-matrix color screen is also offered.

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NEW PRODUCTS

Development tools

Mantisoft Partners has announced the Incontrol Toolbox for Microsoft Corp.'s Windows 3.0 environment.

The product comprises a set of Dynamic Link Libraries for use with development tools including Microsoft's Windows Software Development Kit and Borland International, Inc.'s C++ and Turbo Pascal for Windows. It defines 13 new classes of display and input controls.

The Toolbox costs \$179, or \$249 including the developer's guide.

Mantisoft Partners

3809 Bed Rock

Cedar Park, Texas 78613

(512) 335-3497

Carnegie Group, Inc. has released Testbench Version 2.1.

Testbench is a software tool for building expert troubleshooting systems; it is intended for field and customer service organizations. It comprises a development environment module and a delivery environment module. In addition, Version 2.1 includes the client/server capabilities and the Testview delivery environment module for Microsoft Corp.'s Windows.

The development environment module costs between \$24,000 and \$48,000; the delivery environment module costs between \$200 and \$800.

Carnegie Group

5 PPG Place

Pittsburgh, Pa. 15222

(412) 642-6900

OS/2 software

Gpf Systems, Inc. has upgraded Gpf, its graphical user interface programming tool for OS/2 Presentation Manager.

Gpf (3995) provides developers with a point-and-click development environment for prototyping Presentation Manager. Version 1.3 generates 32-bit C language code. It also allows developers to define custom graphical objects for new user interfaces.

Gpf Systems

30 Falls Road

Mondovia, Conn. 06469

(203) 873-3300

Software applications packages

Decisioneering, Inc. has released Crystal Ball for Windows, a risk analysis add-in for Microsoft Corp. Excel users.

The software calculates best case, worst case and most likely results based on Excel spreadsheet equations that contain uncertain values, allowing users to predict likely results of financial operations, for example. The utility uses Windows' Dynamic Data Exchange to interact with Excel, and it displays results graphically.

The product costs \$195.

Decisioneering

1727 Conestoga St.

Boulder, Colo. 80301

(303) 447-6464

Macintosh products

Cognos, Inc. has introduced Powerplay, an executive information system for the Apple Computer, Inc. Macintosh.

Powerplay provides users with graphical display of data from database and spreadsheet files.

Users can start with general data and drill down to examine particular areas in greater detail. It takes full advantage of Apple's System 7.0 features, according to Cognos.

The software costs \$695 for the first copy.

Cognos

67 S. Bedford St.

Burlington, Mass. 01803

(617) 229-8600

Adobe Systems, Inc. has begun shipping Photoshop 2.0.

The updated software package is fully competitive with Apple Computer, Inc.'s Quadra systems.

It also features four add-in modules that provide features such as JPEG compression support and creation of special photographic highlights.

Photoshop costs \$895.

Adobe Systems

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|---|--------------------------|--------|-------|--------|
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| Processor | 386 | 4 | 4 | NEC |
| 2. Maximum RAM capacity | 64 | 64 | 32 | AST |
| Processor | 128 | 64 | 32 | NEC |
| 3. Internal hard-drive storage capacity | 2.3GB | 1.0GB | 4.0MB | NEC |
| Processor | 4.0MB | 1.0GB | 3.4GB | TM |
| 4. Power supply | 200W | 150W | 150W | NEC |
| Processor | 300W | 220W | 300W | NEC |
| 5. Internal disk | 1 | 1 | 1 | NEC |
| Processor | 4 | 2 | 2 | NEC |
| 6. Swap-in device ports | Two | No | No | NEC |
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NETWORKING

Wireless feast due at Comnet

Vendors such as Ericsson GE and HP announce modems for palmtops

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The wireless data networking scene is expected to heat up at next week's Communications Networks Conference and Exposition (Comnet) '92, with several vendors making product introductions.

By 1996, more than 25% of the U.S. population will regularly use at least one form of wireless communication, which includes cellular services, paging systems, cordless phones and wireless data networks such as radio frequency modems and wireless local-area networks, according to a recent report by The Eastern Management Group. That number should rise to 50% by the year 2001, the Parsippany, N.J., research firm predicted.

Not included in the study,

however, were cellular fax and data applications for mobile networks, such as IBM and Motorola, Inc.'s 2-way Radio Data Link (RDL) service. Services (Ardis), said John Ahlster, senior consultant at Eastern Management. Adding those applications to the wireless data network figures would pump up that 25% figure by another 15%, he added. And the entry of major players into the wireless data networking market would boost those numbers even higher.

One such player, Ericsson GE Mobile Data, Inc., will introduce Mobitex, its first portable RF data modem. The modem works with Mobitex, an open, packet

networking technology for wireless networks developed by Ericsson GE and Swedish Telecom. A nationwide Mobitex network in the U.S. is under construction by Ram Mobile Data, Inc., a unit of Ram Broadcasting Corp.

Also, Hewlett-Packard Co. will show its HP 95LX palmtop computer configured with the Ericsson GE modem.

Through Feb. 15, Ericsson GE will sell the Mobitex, the HP 95LX and an electronic-mail application for \$1,999—\$750 off the regular \$2,749 price.

The e-mail application, from Antenna Technology in Menlo Park, Calif., lets users access private wireless networks through Antenna's Radionet gateway.

In addition, Simware, Inc., an Ottawa firm, will announce a software application that enables users to access their mainframe resources and applications from wireless personal computers over the Ram Mobile Data network. Pricing details for the software were not available.

BT North America, Inc. will announce wireless access into its Tymnet data network. Mobile users will be able to access Tymnet either with a packet data radio from Motorola and the nationwide Ardis wireless network or over a local cellular voice network. For cellular users, BT will demonstrate the packet-over-cellular technology pioneered by Cellular Data, Inc. in Mountain View, Calif.

Midwest Bureau Chief Ellis Booker contributed to this article.

The FCC has not yet said how it will carve up the 220 MHz—which lie in the microwave portion of the spectrum—among competing types of use. In a petition filed with the FCC a year ago, Apple Computer, Inc. asked that 40 MHz be devoted to wireless local-area networks linking personal computers at distances up to 150 ft.

"The FCC has made a great deal of progress in terms of recognizing the importance of wireless data services and is now saying they'll set aside spectrum," said David C. Nagel, senior vice president in the Advanced Technologies division.

Continued on page 68

FCC opens door to allocate airwaves for new technology

BY GARY H. ANTHES
AND ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission recently announced a plan to open the airwaves to emerging wireless communications technologies such as radio-based local-area networks and advanced mobile data.

The commission proposed dedicating 220 MHz of the electromagnetic spectrum to the technologies, and it sketched out a plan to bump existing users such as utilities and railroads to other frequencies or media.



Pizza Hut: Making it great with imaging, EDI

BY ELLIS BOOKER
CW STAFF

WICHITA, Kan. — In the best of all possible worlds, transactions among businesses would all happen electronically, without paper. But electronic data interchange (EDI) has a long way to go before that world arrives.

Just ask Ron Landers, director of expenditure accounting at Pizza Hut, Inc., which uses EDI for some 75,000 of its 175,000 monthly invoices. Landers knows that only a handful of the 90,000 firms Pizza Hut does business with are set up for EDI.

But with an eye to capturing the remaining 100,000 documents electronically, Landers recently installed an electronic document imaging system.

When the Pepco

When the Pepco, Inc. subsidiary consolidates its seven regional accounting offices in Wichita in 1993, Landers' part-time begins working this way: "Vendors send bills to us here," Landers explained. "We'd open the mail, code the invoice, put three pieces of information on each one and then key the item into our McCormack & Dodge accounting system."

However, he quickly decided

to nudge some of Pizza Hut's largest suppliers in the direction of EDI. "In all but one case, we were their first EDI trading partner," Landers said.

Pizza Hut now uses the IBM Information Network for its EDI transactions and hopes to soon implement electronic payment with some of its partners using electronic funds transfer (EFT).

"We stepped back," Landers recalled, "and said, 'We've dealt with 40% of the paper. How do we get the rest?'"

Pileen chosen

After examining available imaging vendors, the accounting unit picked Pileen Corp. in Costa Mesa, Calif.

"The real key to the imaging system," Landers said, "is not the elimination of the paper or the reduction in paper storage costs. It's Pileen's Worldo software." Worldo is a set of proprietary software modules for automating the routing of images and text between people and applications.

At Pizza Hut, Worldo has been used to link the imaging and accounting applications. In the Pizza Hut application, it essentially combines the step of coding the invoice (now an image) and

Continued on page 72

Challenges: Drawing more suppliers into electronic data interchange and reducing reliance on paper forms used by others.

Technology: IBM Information Network and Pileen Worldo software.

Results: An expected 25% productivity improvement, a three-year payback for imaging systems and a 40% reduction in paper volume thanks to EDI.

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FCC allocates airwaves

CONTINUED FROM PAGE 67

nology Group at Apple. "We're still hoping they'll allocate 40 MHz for data PCS, and I'm still very optimistic," he added.

Most of the requests for spectrum for Personal Communications Services (PCS) have been for voice applications such as pocket telephones, and the FCC so far has seemed inclined to let voice and data users share common portions of the spectrum.

However, Apple is urging the FCC to earmark 40 MHz just for data transmission, with data moving in packets, arguing that combining steady voice signals with bursty data traffic is inefficient.

A flexible approach

The commission proposed a "flexible negotiation approach" by which new users would compensate incumbents for the cost of being displaced to higher frequencies than wire-based technology.

The FCC said such negotiations could occur over a 10- to 15-year period, after which the old users would lose their government protection against radio-frequency interference. In response to protests from public safety officials, the FCC said microwave users in the public-safety

sector will not be displaced.

Apple has proposed that wireless data network users require no licenses but that they compensate incumbents through a government-administered fund by paying a surcharge of 4% to 10% on the cost of PCS gear, principally the transceiver that would attach to the personal computer.

According to Nagel, it is difficult to predict applications for a technology that does not yet exist, but he added that data PCS would increase user flexibility and reduce the cost of installing and maintaining LANs.

"It's an extension of plug-and-play; unplug-and-play, actually," Nagel said. "You walk into a room, turn on your portable computer equipped with a data PCS system, and you're on the network with people in the area. There's no one to administer the network. It's a spontaneous, ad hoc network."

Spontaneous sharing

According to Nagel, the technology, which would support multiple 10M bps/sec. networks in one physical space, would enable spontaneous sharing of information at meetings, to which people often fail to bring everything they need. "You have your office with you in the meeting," he said.

Nagel said Apple is currently developing data PCS equipment and could have it on the market within one to two years if the FCC were to approve data PCS today.

Last October, Motorola, Inc. asked the FCC to reallocate some 317 MHz of spectrum for wireless technologies by the year 2000 in order to accommodate the expected explosive growth of wireless applications and users.

The 34 million wireless users today — of which only 15 million represent two-way voice or data users — will grow to 150 million by the end of the decade, according to Motorola.

Motorola officials also played the U.S. global competition card, noting that Japan is already making some 600 MHz of RF available for advanced mobile systems.

A flurry of activity

What sorts of wireless data applications will buzz across the airwaves in the year 2000? And how many people will use these applications?

There will be four categories, according to Booz Allen & Hamilton, Inc., which has made the following predictions about the size of these market segments by the year 2000:

- Field service, field support and logistics. These applications are dominated by package delivery companies that use fleet trucks and field personnel with wireless systems.

Prediction: 2.2 million users.

• Corporate. These applications will involve white-collar sales personnel in the field.

Prediction: 1.8 million users.

• The mobile office. Represented by notebook, laptop and pen-based computer users, the principal driver for this group will be electronic mail and host access.

Prediction: 5.9 million users.

• Personal communications. This catch-all category includes personal E-mail and news, financial, sports and weather reports on portable devices. This last leg of the wireless market could become the biggest.

Prediction: 3.5 million users.

The years 1994 and 1995 will be key for building the hardware, software and network infrastructures necessary for ubiquitous wireless systems, according to Gia Hoxie, partner in charge of the West Coast information industry practice at Booz Allen.

ELLIS BOOKER

One of us has to



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Wireless technology pulls its weight in palmtop market

BY ELLIS BOOKER
CW STAFF

Palmtop computer makers have embraced wireless networking as a logical extension of their products.

However, the size, weight and cost of adding a wireless capability to a palmtop may constrain this attractive add-on to specialized niche applications for the time being, according to industry observers.

The value of a wireless capability for a

palmtop is "proportional to the weight of the portable modem," observed Mark Eppley, chief executive officer of Traveling Software, Inc. in Bothell, Wash.

"If the modem outweighs the palmtop, that defeats the purpose," Eppley explained.

Put another way, the reason users choose a palmtop in the first place probably has a great deal to do with its size (most are about 6½ by 3½ by 1-in.) and weight (most weigh less than 10 ounces).

For his part, Eppley said he bets that two-way, wide-area network communications will not be as abundant as wireless local-area networks. The wireless LAN will make the transfer of data between a new generation of so-called "companion" PCs both seamless and cable-free, Eppley said.

Among vendors with existing wireless networking capabilities for their palmtops are Hewlett-Packard Co., Sharp Electronics Corp., Pojet Computer Corp. and Psion, Inc.

Andy Seybold, editor of "Outlook on Professional Computing," suggested that



wireless connectivity could change the dynamics in the laptop industry. He argued that the reason many users now tote high-powered notebook computers is because "they feel they have to carry everything around."

Seybold said he thinks such companion personal computers will be more powerful than proprietary pocket organizers are today and will run conventional PC software but weigh less than a 4-pound notebook.

Still, the high cost of two-way wireless modems may make them unappealing to individual users.

For example, this month Psion became the first palmtop vendor to sign up for Motorola, Inc.'s RPM4051 integrated packet data modem. But addition of the modem will more than double the \$485 price of the basic Psion HC 128A model, according to Tony Revis, president of Psion.

Because of the cost issues, many analysts said the users of wireless systems will continue to be in vertical markets, such as field sales and field service.

However, a mass market is conceivable, given the synergy between wireless networking and portable computing.

"If you look at the list of potential applications [for palmtops] and look at the list of applications promoted by wireless network providers, there's a tremendous overlap," said Alan A. Reiter, group executive editor of a biweekly newsletter based in Washington, D.C.

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Motorola takes one-way route

While two-way wireless systems for portable computers are still expensive and heavy, analysts predict that less expensive and lighter one-way devices, which receive incoming messages in much the same way a paper does, will find an audience.

Motorola and Embrc are capturing this market with Embrc (electronic mail broadcast to a running computer). Embrc uses a dedicated FM paging channel and is scheduled to become operational by the end of the quarter.

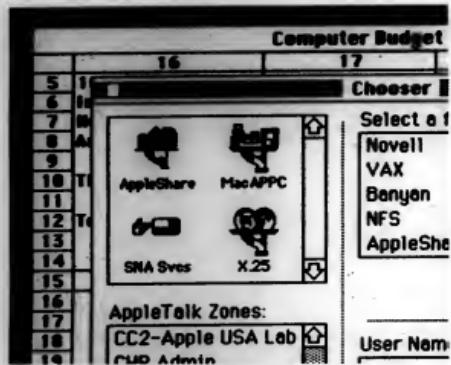
Embrc requires Motorola's proprietary Newsstream radio frequency receiver, which attaches to the computer's serial port. About the size of a pocket pager, Newsstream can hold up to 56 32K-byte messages.

Motorola will sell the receiver — plus software, a user manual and a cable — for \$395. A basic subscription will cost \$15 a month and will include the automatic delivery of news headlines and weather forecasts.

Motorola is also covering its beta. In mid-1990, along with IBM, it launched Advanced Radio Data Information Services, a two-way, nationwide wireless network that now claims 35 corporate customers and 40,000 users.

ELLIS BOOKER

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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

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Fibretrunk host link to debut

BY ELISABETH HORWITZ
CW STAFF

MAPLE GROVE, Minn. — Targeting users with heavy-duty host data transfer applications, Communications Network Technology Corp. (CNT) plans to announce this week a system that is said to provide two-way, 100M bit/sec. rates for up to 32 channel-based host connections.

CNT's Fibretrunk uses fiber-optic cable to link multiple CNT ChannelLink clustered-network processors into a single logical unit that supports arbitrary communications among a group of hosts, peripherals and local-area networks, the company said. The system, which can connect up to 64 ChannelLink processors, allows users to take advantage of recent boosts in throughput rates, CNT spokesman Douglas Anderson said.

The system supports IBM mainframe connections to the following types of systems:

- Another host, for bulk data transfer.
- A high-speed tape drive.
- A 100M bit/sec. Fiber Distributed Data Interface LAN.
- A 45M bit/sec. T3 wide-area network connection.

Support for IBM's Escon is in the works, CNT said.

Fibretrunk supports 100M bit/sec. connections between ChannelLink processors over dis-

tances up to 500 meters and 50M bit/sec. connections at distances up to 1,000 meters, CNT said. The product consists of two components. The Fibretrunk Function Module, priced at \$14,000, is a card that sits in the ChannelLink cabinet to connect it

to the Fibretrunk switch. The 16-port switch costs \$26,000. Each port can support one ChannelLink box, or two ports can be allocated to a ChannelLink box for redundancy purposes, CNT said.

Ports can be added to the Fibretrunk switch in increments of

16, up to a total of 64, at a cost of \$20,000 per increment. Multiple hosts, peripherals, LANs and WAN links can be connected to a single ChannelLink cabinet; however, if too many devices share one ChannelLink, the box can become a bottleneck, and another box must be added to the switch, Anderson said.

CNT is also expected to introduce Channelspeed, a software

product that is said to speed up the throughput of popular bulk file transfer packages, such as Systems Center, Inc.'s Network Datamover, by allowing them to send data over aggregate host channels. Traditionally, such packages are limited to one host channel.

Both products are scheduled for general availability in the second quarter.



Pizza Hut: Imaging, EDI

FROM PAGE 67

updating the accounting package with this information.

Even more helpful is what the imaging system does with the commercial invoices, which arrive as faxes that get straight into the image system via a dedicated personal computer that acts as the fax gateway.

Because the sending phone number at the top of the fax is written in ASCII, it can be recognized and used to search against a master database of Pizza Hut suppliers. When a match is found, additional information can be coded and associated with the image of the invoice.

Another 50,000 incoming invoices a month will be captured this way, Landers predicted.

The imaging system went online in November and currently supports 42 users on Filenet clustered workstations. Eventually, the system could have as many as 100 users.

"We're expecting a 25% productivity improvement and a payback in just under three years," Landers said of his \$1.6 million investment.

Users give nod to Cisco SNA/LAN blend

BY JOANIE M. WEIKLER
CW STAFF

MENLO PARK, Calif. — Cisco Systems, Inc.'s unfolding and shifting strategy to blend IBM Systems Network Architecture (SNA) and local-area network

environments is on the right track, according to users and analysts.

Earlier this month, the company rolled out the third step of a year-old, five-phase plan for merging the inherently incompatible environments. Its Phase

3 router software, slated to ship in March, mainly addresses session loss problems that can result from interconnecting SNA over long-distance LAN-to-LAN connections as well as collapsing separate router and SNA backbones into one network.

One user said this is the most of Cisco's IBM integration strategy for his firm. The introduction of wide-area networks has meant separating LANs by great distances, creating delays in SNA transmission acknowledgments that can result in multiple

retransmissions or loss of user sessions, said Dan Simone, network engineer at the land mobile product sector of Motorola, Inc., a Cisco shop in Schaumburg, Ill. In the current system, Simone explained, users logged on to remote hosts "suddenly get no response, as if you just pulled the plug on their terminals."

The upcoming software version will speed up data acknowledgment by doing it at each local router — in addition to remote hosts — and will lighten wide-area traffic loads, he said.

Simone said another Phase 3 feature, which converts Token Ring protocols to Synchronous Data Link Control wide-area protocols, is key because it lets the company merge its worldwide internetwork of 30 Token Rings with its IBM SNA backbones "and eliminate parallel bandwidth."

Victor Dachovici, senior systems analyst at Lehman Brothers, a Cisco user in New York, agreed. "We want a single router that will put both on the same line," he said.

Meets customer demands

Cisco said that based on customer input, it has tweaked its Phase 4 and 5 plans. It has decided to pursue its PU4 (front-end processor) emulation strategy in favor of quicker support of Advanced Peer-to-Peer Networking (APPN), IBM's scheme to allow for coordinating resource sharing among SNA devices that communicate directly with each other instead of via a host.

"Frankly, we don't want full PU4 support," Simone said. He explained that complete emulation of a front-end processor by a router would require mainframe personnel for configuration changes. Cisco said it will still incorporate some front-end processor properties into the router. Availability is slated to be announced in the fall.

"PU4 on a router requires an incredible amount of computation for processing a single packet. That exacts a penalty on router performance," said Dave Passmore, a partner at Ernst & Young's Network Strategies Group in Fairfax, Va.

IBM's APPN does not yet address 3270 terminal traffic, though industry observers said they expect IBM to announce better terminal traffic support for APPN shortly.

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MANAGER'S JOURNAL

EXECUTIVE TRACK



Jack Sprague has been named vice president of information and telecommunications systems at Transkrib Corp., a Brewster, N.Y.-based printer of business forms, promotional materials and labels.

He is responsible for all of Transkrib's computer and telecommunications systems environments.

Sprague spent 20 years at Nestle U.S.A. His most recent position was corporate vice president of information systems at Nestle Foods Co.

He holds a bachelor's degree from Michigan State University.

Richard F. Morrison, formerly chief information officer at American Express Information Services Corp. (ISC), has been named president of Call Interactive, an Omaha-based joint venture of ISC and AT&T.

Call Interactive provides 800- and 900-number interactive voice services to the entertainment, packaged goods, direct response and advertising/marketing industries. It was formed in 1989.

Morrison became CEO at ISC last year. Before that, he was senior executive vice president and co-chief administrative officer at Shearson Lehman Brothers, Inc.'s information Services Division. He joined a predecessor firm of Shearson Lehman in 1984.

Elliott J. Ross has been promoted to senior vice president of systems and technology at The New York Times Co., Inc., 48, had previously been senior vice president of systems. The change is part of a reorganization at the newspaper designed to stimulate marketing and sales.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, Computerworld, Suite 400, 500 Airport Blvd., Burlingame, Calif. 94010.

Changing the game at Brookstone

Specialty chain dumps mainframe, trims IS staff in a sign of the retail times

BY CHRISTOPHER LINDQUIST
CW STAFF

Tough times call for firm measures, and few industries have it tougher than the U.S. retail business, which just wrapped up its soft sales year in three decades. Godet and game retailer Brookstone Co. knows this and is making dramatic changes to achieve the goals of efficiency and cost control.

Last week, Brookstone told half of its 20-employee information services staff — mainly programmers — that their services will no longer be needed. That is because Brookstone, a Peterborough, N.H.-based specialty mail-order and retail firm, will be shifting from custom software development to the exclusive use of off-the-shelf packages during the next year.

Brookstone is transferring all retail operations from an IBM 4381 mainframe to an Application System/400, leaving the mainframe to handle only the mail-order sales. This shift is expected to save more than \$1 million per year in information systems costs, according to Edward Stanley, director of information services.

"Our whole IS focus is going to be implementation, training and support rather than custom development," Stanley says.

Most of the savings should materialize through reduced personnel and support expenses. The move to the

AS/400 is also intended to increase operational efficiency via such means as better inventory control.

Stanley says he wants to reduce Brookstone's IS costs as a percentage of sales to a level equal to or below the

target; that's a necessity," Stanley emphasizes. "It's not a luxury anymore to be anything but a well-oiled machine."

Stanley, who has been with the firm for 11 years, will oversee the largest wholesale change to computer operations at Brookstone since the retailer rented its first computer time from the local Gurney-Cattle Club (see story page 89).

All of this change is a result of a decision made two years ago to totally reorganize the company's computer systems, according to Jeffrey Temple, Brookstone's vice president of finance and systems. Mainframe-based systems that were originally developed to handle the mail-order operation were not up to the task of retail sales, which had gradually become the primary focus of Brookstone's operations.

"What we had was a base system that was crumbling," Stanley says, describing the current systems as having "four or five years' worth of Band-Aids for retailing on top of them."

However, before the new AS/400 could be implemented, an effort at spin control had to be made to buy the company some planning time. As a result, IBM's Data Interpretation System, a graphical front end to DB2, and Comshare, Inc.'s Arthur Planning, a scheduling/planning and retail forecasting/information system, were brought in to prop things up. Both packages leveraged a strong point of Brookstone's systems — access to large amounts of detailed

Continued on page 89



Stanley thinks the break from an IBM 4381 to AS/400 for retail sales will save \$1 million a year

industry average of 0.8%. Brookstone currently spends 1.2% of its sales on IS; annual sales are \$100 million.

"Being efficient operationally — that's no longer a competitive advan-

tage," Stanley says.

Most of the savings should materialize through reduced personnel and support expenses. The move to the

only 7% said their experience had been unsatisfactory.

"The strong feeling [among respondents] was that outsourcing was one more arrow in the quiver, one more tool in the tool kit of IS and definitely worth taking a look at," said Executive Insight Vice President Jack Cooke. Most survey respondents were the top IS executives at large companies in pharmaceuticals, banking, manufacturing, energy, insurance and other industries.

A noteworthy 83% disagreed with the statement that IS activities were viewed as nonstrategic by their senior management and therefore likely to be outsourced to save money. "Costs were really not the key factor," said Executive Insight Vice President Jack Schrodell, who coordinated the survey.

The survey was completed before the recent Electronic Data Systems Corp. lawsuit against Computer Associates International, Inc., but Schrodell noted that many firms that have outsourced said they have experienced difficulties with CA on the transfer of software licenses.

CA's policies "have been one of the biggest obstacles to firms that are trying to outsource. A lot of people are upset with them," he said.

80% satisfied with outsourcing, survey says

BY CLINTON WILDER
CW STAFF

The buzz remains very much on the outsourcing rose, according to about 100 competitors polled in a recent survey. And it appears that most of the impetus for outsourcing comes from strategic and not strictly cost-cutting motivations.

The 103 Fortune 500 firms surveyed in late 1991 by the Bryn Mawr, Pa.-based Executive Insight Group, Inc. expressed strongly favorable opinions about outsourcing all or part of their information systems function. Of the 60 companies in the survey that have already chosen outsourcing, 80% said they have achieved satisfactory results, and



Cooke: Outsourcing worth looking at

One respondent wrote, "We could have a strategic system that a vendor could implement more quickly than we could, therefore accelerating the benefits."

Still, many respondents issued "buyer beware" warnings to those considering outsourcing. Schrodell said the best outsourcing results are achieved when the IS department has optimized its own operation as much as possible, then turns to a vendor for further improvements or needed expertise.

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CA's policies "have been one of the biggest obstacles to firms that are trying to outsource. A lot of people are upset with them," he said.

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COMMENTARY

Les Gilliam

Techie jobs less risky?



A lot of people with outstanding technical talent absolutely refuse to consider a management post. On the other hand, there are many highly motivated people who can't wait

to become somebody else's boss.

What about those others who have performed well in a technical job but are told their next assignment is a supervisory position? Is the change from a technical to a management career always the best choice? Can you ever go back?

The following stories are true. The names have been changed out of consideration for those who have already suffered enough humiliation.

► Jack was an outstanding systems programmer and soon became the leader of the group. Wanting to advance, he accepted more and more responsibility until he found himself in the corner office with the title "IS manager" on the door.

When his company acquired another firm, he moved his family to a distant city

to complete the merging of the two computer groups. He was promoted to vice president and headed a multifunction organization.

Then came the day he was told the company had decided to thin its management ranks and that his position could be eliminated. Ironically, this was possible because he had recruited and developed outstanding leaders in his various areas of responsibility.

► Joe was a top-notch applications programmer who moved to analyst, project leader and eventually applications manager. Because of his outstanding leadership skills, he was promoted to data center manager.

His company was acquired by a firm that had its own data centers. When it was

announced that outsourcing was to be considered, Joe suggested merging the data centers. He headed the study that resulted in his idea being adopted. But then the ax fell. The data centers were to be merged, but he would not be the manager. His position was eliminated. ► John was an outstanding accountant who became the assistant financial manager of the company. With this position came the responsibility for supervising the computer group. But when times got tough, the company decided his was a position that could be eliminated.

In all three cases, these managers had been outstanding technical employees but accepted management assignments. When their positions were eliminated, they were not given the choice of a demotion or returning to a technical position. They soon discovered that their ages (late 40s/early 50s), salary level and management experience were liabilities in finding other jobs.

Even worse, the break in service between companies will cost them in retirement benefits because the primary factor in the retirement formula is continuous years of service.

Jack found a job, hired by a friend at another company but at two levels lower than his prior position. Joe and John are still searching.

Should successful technical employees aspire to management? How often do they have a choice? If they refuse the management assignment, are they threatened with limited advancement?

Experienced technical people who maintain their knowledge and skills are always more marketable than those with only management skills to offer. Granted, managers tend to earn higher salaries than technicians when they are working, but to be let go after many years of service can bring devastating financial and emotional results.

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December 21, 1992

PC MAGAZINE

EDITOR'S CHOICE

December 21, 1992

Unlimited access to information

There's virtually no limit to the number of ways that CD ROM data can be merged into your network. Each CD Net 428 provides 18.4 gigabytes of incremental information.

The rewards of moving into management usually include higher pay, more influence, greater responsibility and increased recognition. But with these rewards come much greater risks, such as personnel problems, dependency on subordinates for success, loss of technical expertise and portability, exposure to reorganizations and management change and being viewed as noncritical to the success of the business.

In today's economy, mergers, consolidations and outsourcing have made management jobs in IS riskier than ever before. In many big outsourcing deals, those in technical positions at least have the option of continuing to work for the outsourcing vendor. Those in management positions are often more expendable. Let the employee beware. There are no guarantees of a job for life, no matter how outstanding the performance or how faithful the service. Every payday the company settles the account, and the cycle starts over — with no assurance beyond today.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Painesville, Ohio.

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series that's second to none. Many customers are already enjoying the benefits of the Symmetrix Series. If you would like references or product literature, please call EMC at 1-800-222-EMC2 ext. L183C (in MA call 508-435-1000, in Canada call 1-800-543-4782).



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ings on hardware may wind up being spent on software and personnel.

6. **Gaines:** Productivity is expected but may not happen as quickly as anticipated. Many client/server users will be new users with little experience in technology.

7. **Jobs redefined:** End users accessing more data means workers can do things differently and can do different things. — *Alan J. Ryan*

"The Standards"
By Scott Wallace

Inform
January 1992

■ Standardized health care systems may be just what the doctor ordered. Standardization would help health care providers get the most for their money, but progress has been slowed by rising costs, reduced resources and the diversity of the electronic medical systems typically found in medical environments.

The American College of Radiology and the National Electrical Manufacturers Association have been working together to develop a standard for interconnecting medical imaging equipment that would meet the needs of the medical community.

The criteria is that newly acquired data should be transferable to central viewing location; patient information that is clinically relevant should be accessible from these locations; transfer of images and data should take place without corrupting the data; information should be simultaneously accessible from more than one site; and it should not be difficult to add equipment to a communications group.

To provide a forum for the exchange of information regarding standards development for health care IS, a consortium called the Healthcare Information Standards Coordinating Committee has been formed.

Its goal is to collaborate with national groups to isolate a set of operational standards that support the breadth of health care computing requirements. — *Kelly E. Dwyer*

"Information Systems and Transborder Data Flow"
By Elaine Waples and Daniel M. Norris

Journal of Systems Management
January 1992

■ Global information systems pose more than a technical challenge alone. For systems controllers and auditors — whose jobs will expand as companies become global — these systems also represent the political, economic and cultural factors of more than one country.

The primary area of concern for global IS is transborder data flow. Many countries place restrictions on the flow of information across their borders for privacy protection, economic issues and national sovereignty considerations.

Economic regulations imposed by various countries can decrease data timeliness and reduce economies of scale allowing by causing production inefficiencies.

Also, some developing countries fear becoming technologically dependent on other countries so they impose obstacles to data transmission to multinational companies. — *Alan J. Ryan*

Engineering documents are the lifeblood of a manufacturer. And there are literally hundreds of thousands of documents inside every plant. Operating instructions, performance data, project plans, manufacturing safety data sheets, heat and material balances, engineering drawings, regulatory specifications. And the list goes on.

Manufacturers are working hard to overcome a host of problems associated with managing this myriad of documents: security issues, timely access, tracking who's updating which version of what document. All the while facing new government standards for auditability and ease of access to all plant documents.

New Requirements, New Demands

The large number of interdependent engineering documents needed to operate and maintain a manufacturing plant can no longer be scattered between various libraries, file cabinets, desk drawers, and engineering vaults. Emerging regulatory requirements and quality issues have resulted in an unprecedented need for controlled and timely access to these critical documents, including underground piping layouts, electrical schematics, process hazards analysis, operating procedures, emergency shutdown procedures, and policy manuals.

In the petrochemical industry, for example, companies are under increasing pressure to meet stringent new safety regulations and emergency response guidelines, or face multimillion-dollar fines. Compliance often means providing an accurate audit trail of equipment and piping changes — from how the plant was built to its current state — as well as being able to trace accountability and provide detailed reports.

DOCUMENTING THE CHALLENGE



IN TODAY'S MANUFACTURING ENVIRONMENT

As another example, more than thirty countries have adopted the ISO 9000 initiative and its related standards for manufacturing and engineering quality. Vendors that fail to satisfy these requirements risk having their products shunned by companies whose own customers will require evidence of certification. Compliance requires documented design reviews, design modifications and verifications, and approvals.

Traditional Document Management Approaches Are Obsolete

It's clear why accurate tracking of changes in complex engineering documentation is now a business necessity. Yet control is complicated. Today's manufacturing plants typically access over one million documents, with an expected increase of 20 percent per year — far more than manual systems can handle.

Ironically, the proliferation of new technologies that automated many manual systems has also created daunting challenges. The introduction of computer-based tools, such as CAD and word processing workstations, has resulted in engineering drawings that exist as paper drawings, complicated mylars, vector files distributed on workstations, and even optical disk files storing master images. Supporting documentation exists as online word processing files and spreadsheets, handwritten notations, prepared forms, and voluminous procedure manuals.

The scenario is further complicated because any one of these documents may be included in numerous document sets. Updates initiate cascading updates across the plant. If, for example, an engineer redesigns a piping configuration to allow added manufacturing flexibility, that change must be noted on all the supporting documents.

Frequently, however, the document has been copied several times and updated by different departments without coordination. The result is users not knowing which copy is the most current, and managers unable to audit and control documents. Information cannot be retrieved fast enough to meet decision-making timeframes.

Creating an Integrated Engineering Document Environment

Thanks to recent advances in the information technology marketplace, manufacturers can now adopt a strategic approach to building an integrated engineering document management system (EDMS) that will go a long way toward meeting the information needs of a plant or process engineering organization.

The most effective EDMS plan is based on a four-step approach:

◆ First, the strategy must support various accounting schemes throughout the corporation. The system should incorporate all forms of engineering, design, and test documentation in a relational database. Retrieval should be easy to use, provide fast access, and require little training. And it must be flexible, to accommodate the uncertainty of future regulatory reporting requirements and the evolving needs of a variety of users. For example, some users may choose to search for documents by name or class, while others prefer to search by keyword or closest-match [known as fuzzy search].

◆ The engineering document management system must provide a broad range of security devices to protect against unauthorized access, minimize document loss and, most important, ensure that the documentation stays up-to-date.

◆ The engineering document management system must also provide archived files that record the history of all changes made to the documents. This audit trail is key to demonstrating regulatory compliance.

◆ Equally important is the ability to integrate the document management system with other enterprise-wide systems, which are likely running on a variety of PCs, workstations, and mainframes. As technologies evolve and the needs of a corporation develop over time, the engineering document management strategy must accommodate these emerging technologies while preserving existing system investments.

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Digital's Solution for Engineering Document Management: DECedms

It's the only commercially available EDMS product specifically for process manufacturers. And you helped design it.

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DECedms Does It All

DECedms provides complete control over a plant's engineering documents and related information — from the moment documents are created through archival storage at the end of a project. It combines the powerful document management capabilities of EA Systems Inc.'s Re-Solution product with the unique retrieval and indexing capabilities available with Excalibur Technologies' Savvy/TRS. The result is a client/server-based document management system scalable from small to global levels.

With DECedms, you have access to the most accurate information because you are always aware of changes that are in process. When a change is made to one document, DECedms deals with the design change dependencies and facilitates updating of all documents affected by the change. The system also provides archived files that record the history of all changes.

While various available technologies address parts of the plant document problem, DECedms is unique in managing and controlling all plant document types, regardless of their original format — from engineering drawings to office documents, from online forms to CAD drawings, from text drafts to handwritten manuals, scanned, converted, or input directly.

Once you've stored documents, you can retrieve them in a quick, flexible way — using requests based on a key-word, file name, or closest-match clue. Indexing smartly includes complete cross-referencing.

Documents can be easily distributed on existing desktop devices within your network. And, because it is a standards-based solution, incorporating Digital's Network Application Support (NAS) products, DECedms also allows you to link into additional operational systems, including environmental health and safety, manufacturing management, process engineering, and other core databases across the enterprise.



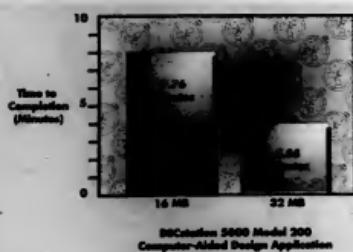
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shown below, a Mechanical Computer-Aided Design application runs two times faster on a DECstation 5000 Model 200 — just by increasing memory from 16 MB to 32 MB.



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Because Digital memory products are designed for Digital system architectures, you're assured the highest levels of performance and reliability. Nonetheless, our memory products are automatically covered under your existing service agreement. So there's no extra charge. Our award-winning service organization has got you covered, around the clock and around the globe.

For answers to any questions on our memory products, contact your local Digital representative or authorized Digital distributor. Or, to place your order via DECdirect, call 800-DIGITAL (800-344-4825) and reference code AG01.

THE TIME IS RIGHT

Time is increasingly the most important ingredient to competitiveness and return on investment. As you deal with the challenges posed by the ongoing integration of people, business, and technology, Digital Consulting Services can help you compress the amount of time required to go from identifying it need to implementing a solution. But, you may wonder, why ask a computer vendor to consult with you?

Experience Counts

The value that Digital brings to the consulting field stems from the knowledge we've gained from our 35 years of experience designing, developing, and implementing hardware and software solutions. This positions us quite differently from a company whose only business is consulting services or systems integration.

Our experience qualifies us to transfer and apply our knowledge to your business. Whether it's re-engineering a business process, helping work the human elements of change, implementing an application around a vertical industry, or helping with a technology that augments your in-house talents, as we consult with you, we can help you achieve the desired results in less time. We can do this for you because we've already done it for ourselves.

Keep in mind that Digital is now in the solutions business model that includes service and support as well as hardware and software sales. Consulting is often a necessary element in the solution we provide for a fee — and very much a part of added value Digital brings to the table.

Consulting Services are part of our commitment to providing Open Services in support of Open Systems. Our Consulting Services team includes more than 4,000 people worldwide. And that's not counting our access to experts in other organizations across Digital, such as engineering, manufacturing, software development, information systems, and finance. Plus, we have strategic alliances with companies outside Digital whose knowledge skills complement our own.

Good consultants understand your business almost as well as you do — from a different perspective. They listen, then apply their knowledge to your problem.

Success Speaks for Itself
We have successfully undertaken consulting projects with a variety of customers across multiple technologies and industries, including office systems, electronic publishing, business systems, manufacturing and process industries, telecommunications, healthcare, and financial services.

For example, Digital recently completed a workforce change management consulting project with a worldwide agricultural chemical company. An established Digital customer, this company needed to re-think its new product production techniques, while at the same time complying with new U.S. Environmental Protection Agency regulations. Digital Consulting Services was invited to assist in assessing where and how to start a streamlining process. Our initial study recommended that streamlining begin with the R&D regulatory process, followed by a phased implementation. Now, the results are in:

- Improvements in business practices resulted in significant reduction in report preparation time; one report was reduced from one and one-half weeks to two days, another from eight weeks to five weeks. Overall, two months were cut from the production cycle time due to procedural changes, such as integrating joint or concurrent ownership of project phases as well as motivation to get the work done right the first time.
- Scientists' productivity doubled, as reports were reviewed fewer times and less technical components of the process were off-loaded to other staff members.
- Financial benefits are bringing an impressive payoff. After an outside investment of \$500,000, 240 percent return-on-investment was realized initially, with 400 percent return-on-investment expected over the lifetime of the project.*

*Based on information from an October 1991 Workforce Change Management Case Study, INDUSTRY SERVICE, published by Gartner Group Inc.

RESULTS *not* Reports

Digital Consulting Services Program Overview

Some consultants may feel the job is done once they've presented you with a stack of reports and recommendations. Not so with Digital. Our Consulting Services are designed to provide all facets of your business with real solutions and measurable results. Here's a sample of the broad range of programs we currently offer — and all can be tailored to meet your specific needs:

- **Management Consulting**
 - Strategic planning
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 - Change management
 - Education planning
- **Information Systems Consulting**
 - Distributed systems architecture planning in a multivendor environment
 - Computer-aided software engineering (CASE) environment design and implementation
 - Systems and network security review and implementation
 - Capacity planning
 - Network management and performance analysis

- **Applications Consulting**
 - Electronic document interchange (EDI) planning, design and implementation
 - DECwindows application development
 - Business application analysis, design, and selection
- **Technology Consulting**
 - Database design, implementation, and system performance review
 - Networks and telecommunications planning and design
 - Transaction processing systems design and implementation

For more information on Digital Consulting Services, contact your Digital Sales representative.



ADVANTAGE-NETWORKS

Brings You Coexistence, Integration, and Choice with OSI, TCP/IP, and DECnet Protocols

Trying to build a network in today's multivendor computing environment can work one of two ways: You force fit your network into your vendor's product design. Or your vendor's products are open and flexible enough to fit your network.

Digital offers you the open, flexible choice. Our ADVANTAGE-NETWORKS family of products is designed to streamline the coexistence and the integration of OSI, TCP/IP, and DECnet protocols — letting you build in varying degrees of interoperability when and where needed.

ADVANTAGE-NETWORKS and OSI

Since 1986, Digital has offered OSI-based capabilities for local and wide area networks. The OSI-based products we offer today include:

- DECnet/OSI for ULTRIX, providing an extensive range of integrated OSI features and functions for ULTRIX systems
- Extensions for DECnet-VAX, a seven-layer OSI protocol stack for VMS systems, soon to be followed by DECnet/OSI for VMS
- OSI Programmer's Toolkits for ULTRIX and VMS
- A full family of multiprotocol routers
- Message Router X400 Gateway for electronic messaging
- DEC/EDI for electronic document interchange
- DEC OSI manufacturing network interconnect for Manufacturing Message Specification
- 802.3-based communications products for local area networking.

ADVANTAGE-NETWORKS and TCP/IP

For over a decade, TCP/IP has enabled computer systems with many different operating systems to communicate. It is the predominant protocol in the Internet, a worldwide interconnection of thousands of networks, and it is the de facto standard



ADVANTAGE-NETWORKS opens your networking environment, allowing OSI, TCP/IP, and DECnet to not only coexist but integrate smoothly with one another.

for networking UNIX systems. Digital is committed to providing the same level of investment protection for TCP/IP as with OSI and DECnet. To this end, our ADVANTAGE-NETWORKS line of products includes:

- TCP/IP bundled with the ULTRIX operating system, providing the same TCP/IP protocols as Berkeley BSD4.3 UNIX, NFS (Network File System) is also incorporated for transparent file sharing
- DEC TCP/IP Services for VMS, a layered software product that provides TCP/IP and NFS (Network File System) for VMS systems
- PATHWORKS software, allowing PCs to integrate with ULTRIX or VMS systems via TCP/IP or DECnet
- DECnet 300, combining TCP/IP and DECnet functionality with an enhanced version of LAT software
- A full family of multiprotocol routers
- WAN Device Drivers with the ability to pass OSI, TCP/IP, or DECnet over synchronous links.

ADVANTAGE-NETWORKS and DECnet

With a 16-year track record and more than 968,000 active implementations, DECnet continues to provide a leading method for peer-to-peer networking. As you know, DECnet is supported on virtually every Digital platform, as well as on MS-DOS, OS/2, Apple Macintosh, and SCD UNIX. To preserve your investment in DECnet, the ADVANTAGE-NETWORKS family provides complete compatibility between DECnet Phase IV and DECnet/OSI. All Phase IV systems, applications, and network components continue to function in a DECnet/OSI environment. DECnet/OSI allows 64,000 DECnet Phase IV commands addresses to coexist in an OSI network.

A broad range of options lets you set the pace of transition from a DECnet Phase IV network to an OSI network — so you can transition end-systems, DECnet areas, and backbone routers at any time, in any order.

The Advantages Are Built In

The ADVANTAGE-NETWORKS family gives you the ability to build a single multivendor network utility to connect all users, so that no system remains an island unto itself. And you reap the benefits of working in a truly open computing environment:

- From a cost standpoint, standard de facto standard networking protocols are the core of the ADVANTAGE-NETWORKS family. For ULTRIX-based systems, OSI, TCP/IP, and DECnet are licensed with the system. For VMS-based systems, OSI and TCP/IP is offered as a layered product that includes a Network File System (NFS) Server. Participation in Digital's Software Upgrade Services assures you immediate access to the most current releases of ADVANTAGE-NETWORKS software.

- From an integration standpoint, users are no longer confined to computing islands, defined by a network protocol. For example, OSI, TCP/IP, and DECnet users on a network can access each other's resources through a variety of application gateways, multiprotocol terminal servers and routers, and multiprotocol end-systems. Internet Standard RFC 1006 is now included on ULTRIX systems so that TCP/IP network users can access OSI applications. In an open systems environment, Network Application Support (NAS) products build on the system level integration provided by ADVANTAGE-NETWORKS. NAS is a comprehensive set of standards-based software products that provide for application integration across multivendor computing platforms.

All told, ADVANTAGE-NETWORKS gives you the power to use the most innovative, cost-effective solutions from multiple vendors, confident they will work together.

For more information on these and other product members of the ADVANTAGE-NETWORKS family, contact your Digital sales representative. Or call 800-DIGITAL (800-344-4825).

Changing the game at Brookstone

CONTINUED FROM PAGE 77

data. The packages "let us have the time to change the foundation of the house," Stanley says.

That foundational change will take place over the next eight months. Primary to it will be the introduction of the AS/400 and the purchase of a commercial retail sales application that will be used as-is out of the box, according to Stanley.

Another advantage of using a prebuilt package will be to allow the IS department to concentrate on business issues rather than development, which is costly in both dollars and time. Information-related issues are critical to a company that makes all of its profit during a three-month period.

"We're really two companies," Stanley says. "Nine months out of the year, we're kind of floating along with low vol-

umes. When all hell breaks loose, efficiency becomes almost secondary to timeliness and service."

As a result, Stanley says, the firm must react like a long-distance runner who needs to be able to maintain an efficient, strong pace through most of the race but must have a good kick at the end to remain competitive.

Brookstone has just come away from what Stanley describes as a "very good Christmas," but it is heading into a new year fraught with change — and not all of it pleasant. The end result, he hopes, will be a firm ready to compete in what is shaping up as a very difficult decade.

"We're going to be making sure that our system implementations are able to withstand both the long, steady pace and the big kick," Stanley says.

Round 'em up

Brookstone followed a somewhat unusual path to computerization — a cost path, to be exact. The company rented its first computer time from a local organization, the Guernsey Cattle Club, more than a decade ago.

But computer systems designed to track bovine life histories are not necessarily well-suited to tracking product inventory, and finding ways to make such a system function has long been the work of Edward Stanley.

When Stanley started at Brookstone 11 years ago, the company was primarily mail order. It took in \$20 million in annual sales from the catalog and \$4 million from retail sales.

That situation has reversed itself in recent years, however. Currently, only \$15 million of the company's \$100 million in sales is derived from the catalog. The rest comes from some 97 stores nationwide.

However, Brookstone's computer

systems have long been pushing their limits. When the company moved from renting time from the Cattle Club to running its own system, the decision was made to hire away one of the club's programmers and buy an IBM 4381 rather than design a system from the ground up for itself.

"It was the easiest and quickest way," Stanley says. "The company was growing, and they didn't want to slow things down."

Brookstone paid a long-term price for the decision, however. Two years ago, the company decided to take serious action to head off what appeared to be an imminent systems collapse.

"We knew we were in tough times," Stanley says. "We knew we had to make some changes. We knew we had to survive a couple of Christmases."

Those changes, including a "right-sizing" from the mainframe to an AS/400 for retail operations, will be taking place over the next year.

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CALENDAR

FEB 16-27

Information Security Managers Symposium, San Diego, Feb. 16-20 — Contact: Pamela Beaton, MIS Training Institute, P.O. Box 4200, Framingham, Mass. (508) 879-7799.

CASE World Conference & Exposition, Santa Clara, Calif., Feb. 19-20 — Contact: Digital Consulting, Andover, Mass. (508) 879-3884.

FEB 23-29

Annual Platform for Generating PCI Forum, Tinton Falls, N.J., Feb. 23-26 — Contact: Software Publishing, One New York, N.Y. (212) 759-3434.

Business Model Co. Brokering Roundtable Conference, San Francisco, Feb. 24-25 — Contact: Gary Glavin, CMCI, San Francisco, Calif. (415) 399-5202.

Object Oriented User's Group's Organizational Modeling, Novato, Calif., Feb. 25 — Contact: Steve Morris, Advanced International, Novato, Calif. (707) 545-0100.

MARCH 1-7

ACM Computer Science Conference, Kansas City, Mo., March 1-7 — Contact: ACM Headquarters, New York, N.Y. (212) 865-1440, Ext. 223.

10th Annual Computer-based Training Conference & Exposition, Orlando, Fla., March 2-5 — Contact: The Conference Department, Washington Publications Inc., Boston, Mass. (617) 542-0100.

12th Annual Conference on IS Performance/Computer & Exposition, Indianapolis, Ind., March 2-4 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-2022.

Directions '93: IBM's 25th Annual Computer Industry Briefing Sessions, San Jose, Calif., March 5-

Contact: International Data Corp., Framingham, Mass. (508) 879-6200.

MARCH 8-14

The CEO Perspectives Series — The Business of IT: Playing the Payoff, San Diego, March 8-12 — Contact: CEO Insights, Framingham, Mass. (508) 879-4631.

ERP Audit Managers Roundup, Kinsale, Ireland, March 9-11 — Contact: Paul Bissett, MIS Training Institute, P.O. Box 4200, Framingham, Mass. (508) 879-7799.

Third National Court Technology Conference, Duluth, March 11-12 — Contact: National Center for State Courts, Wilmette, Ill. (847) 252-2000.

Directions '93: IBM's 25th Annual Computer Industry Briefing Sessions, Boston, March 12-13 — Contact: International Data Corp., Framingham, Mass. (508) 879-4200.

MARCH 15-21

Goddard's '93 Spring Conference, Los Angeles, March 15-19 — Contact: Goddard Headquarters, Chicago, Ill. (312) 844-0100.

Global Technology and Information Management Conference, St. Louis, March 17-18 — Contact: Robert A. Rosen, Washington University Center for the Study of Data Processing, St. Louis, Mo. (314) 935-4791.

MARCH 22-26

Global Networking Officers Forum, Washington, D.C., March 23-25 — Contact: Wayne Horwitz, Technical Transfer Institute, Santa Monica, Calif. (310) 394-6300.

OUR TOOLS AUTOMATICALLY CONVERT CICS COBOL to NATIVE AS/400

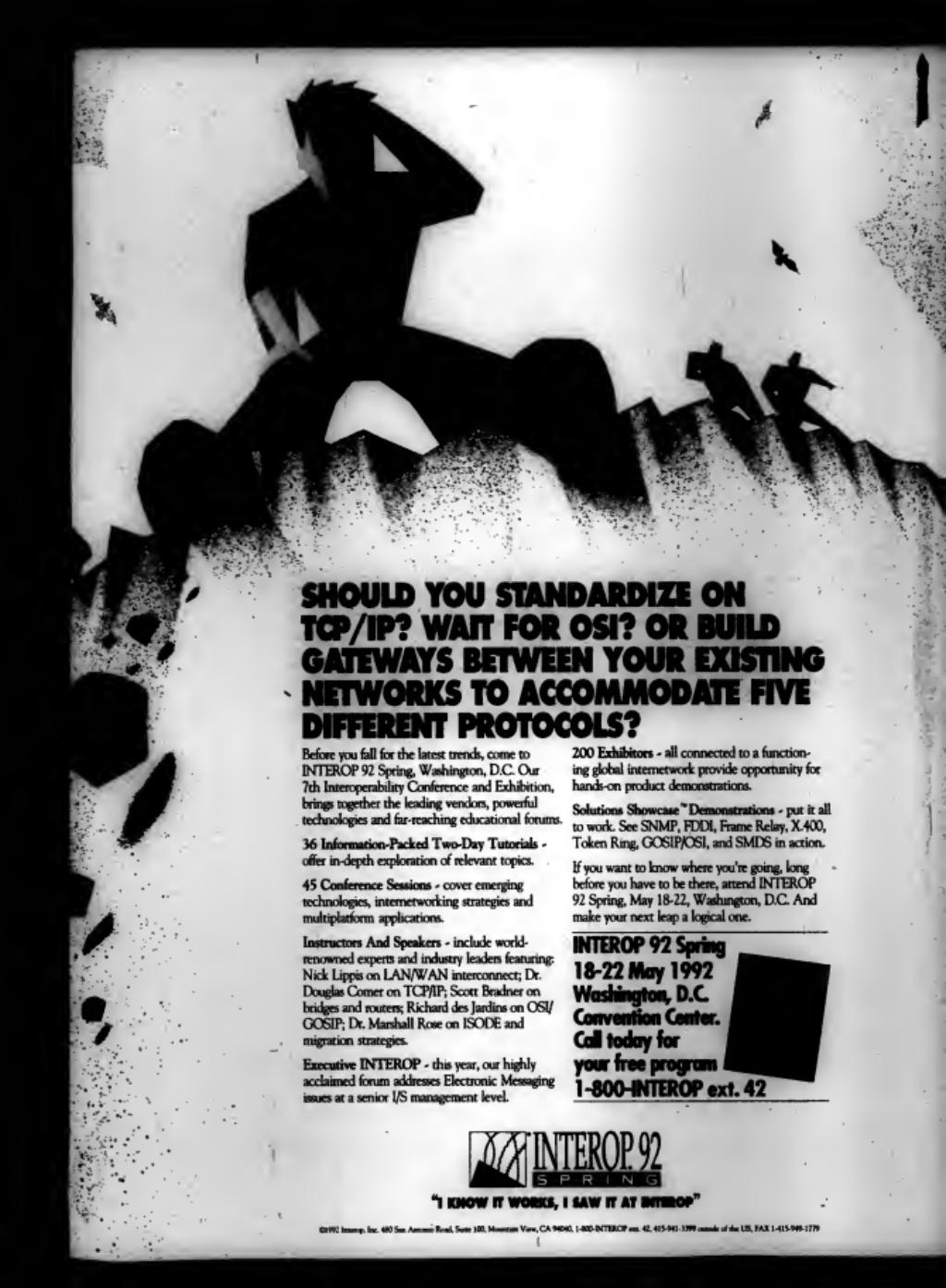
- Utilize proven proprietary software tools
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- Use AS/400 utilities to maintain programs, screens and data bases
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Before you fall for the latest trends, come to INTEROP 92 Spring, Washington, D.C. Our 7th Interoperability Conference and Exhibition, brings together the leading vendors, powerful technologies and far-reaching educational forums.

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Instructors And Speakers - include world-renowned experts and industry leaders featuring: Nick Lippis on LAN/WAN interconnect; Dr. Douglas Comer on TCP/IP; Scott Bradner on bridges and routers; Richard des Jardins on OSI/GOSIP; Dr. Marshall Rose on ISO/SPDE and migration strategies.

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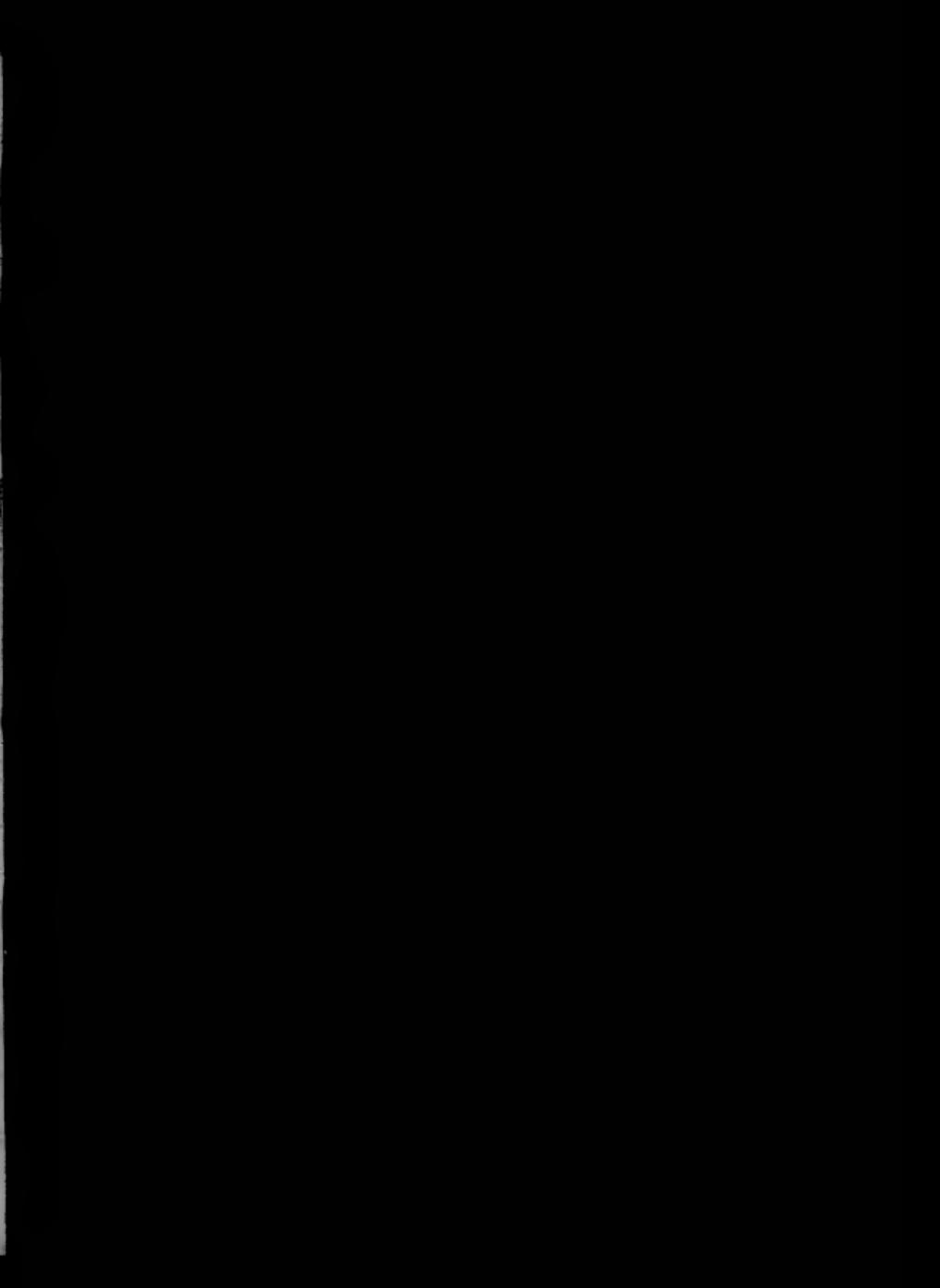
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SUPERCOMM ICC '92

SUPERCOMM '92
International
Conference and
Exhibition

ICC '92
International
Conference on
Communications

June 15-18, 1992
McCormick Place
Chicago, Illinois

Who We Are

SUPERCOMM '92
Co-Sponsors:



Based in Washington, D.C., USTA represents 1,100 local exchange telephone companies throughout the United States.



The 500-member association headquartered in Washington, D.C. represents manufacturers and suppliers of telecommunications equipment and services.

ICC '92 Sponsored by IEEE's Communications Society:



The Institute of
Electrical and
Electronics Engineers

An organization with over 300,000 members worldwide, IEEE promotes the interests of the electrical engineering profession.



IEEE's
Communications Society

This 30,000 member group within IEEE keeps electrical engineers with communications interests abreast of emerging computer and communications technologies.

Explore new gateways to knowledge as SUPERCOMM once again co-locates with the International Conference on Communications (ICC) - this year in Chicago at McCormick Place. This world-class exhibition and two premier conferences promise to be even more exciting, informative and global than ever before!

Don't miss your chance to hear the industry's top leaders. Attend dozens of informative sessions that will help your organization ... and enhance your career. And get a hands-on view of the directions telecommunications will take in the future.

Over 450 exhibiting companies and 20,000 industry professionals from more than 80 countries are expected to attend. Meet and network with potential customers, manufacturing manufacturers, technology innovators, government policy makers, telcos, interexchange carriers, telecom/MIS managers, and other users.

**How To Plan For
The Telecommunications
Event Of The Year**

With three series of programming ranging from non-technical to technical, as well as the world's largest annual telecommunications exhibition, deciding what to see and do will be an exciting challenge! You'll be able to choose from the following:

Free Exhibits
Tuesday - Thursday
No Exhibits Monday

Because exhibit space has grown dramatically and is selling out earlier than ever, you'll be able to walk through more than 400,000 square feet of high-tech displays and see hundreds of new product demonstrations.

Three Valuable Feature Presentations - All Free - To Start Your Days

ICC '92 Vice Chairman Frank Spill of Northern Telecom opens Monday morning with international panelists Theodor Innerer, Director of CCITT and Europe's Used Aztec, Chairman of Telefonica International. Discussion focuses on the changing world of international telecommunications and standards, exploring a year's overall theme: "Discovering a New World of Communications."

Tuesday morning, keynote speaker and Motorola Chairman George Fisher discusses "Learning to Compete in a Market-Driven Wireless World." As a driving force behind Motorola's success in wireless communications, Fisher will tell you what you need to know about wireless and how it will affect you.



Motorola Chairman George Fisher

The Wednesday morning Opening Session will highlight the role of telecommunications in education. Watch for more details in future brochures.

**Major Addresses At ICC '92
Luncheon On Monday And
Banquet On Tuesday**



On Monday the ICC '92 Awards Luncheon will feature William L. Weiss, Chairman and CEO of Ameritech, providing insight on building an information society. ICC '92 fee applies.



The ICC Annual Banquet on Tuesday night will be addressed by George Heimler, the new President and CEO of Bell Communications Research. Before you provides research and other technical support to the Bell Regional Holding Companies, Cincinnati Bell Telephone Co. and Southern New England Telephone Co.

ICC '92 fee applies.

Seminars And Lectures On Three Different Levels

Three different educational levels plus many tutorials and workshops - you choose the tracks which will benefit you most, and the speakers will bring you insight into a multitude of telecommunications issues.

100 Series

Attend 43 free SUPERCOMM '92 non-technical seminars where you'll get a practical education and enter into lively Q & A on important and timely subjects ranging from fiber in the loop and network reliability to SONET and fast packet.

200 Series

Also, approximately two dozen application-oriented sessions are targeted to SUPERCOMM attendees by ICC '92. This practical and inexpensive programming will be most valuable to telcos, interexchange carriers, and telecommunications professionals from both public and private networks who need a somewhat technical viewpoint.

300 Series

In addition, there will be more than 50 moderately priced ICC '92 technical sessions sponsored by the Communications Society of The Institute of Electrical and Electronics Engineers.

400 Series

For technically-oriented professionals seeking an overview, ICC '92 also offers eight full-day and half-day tutorials and workshops.

SUPERCOMM Program Participation By A Wide Variety Of Organizations

From the Association of Data Communications Users to the Pacific Telecommunications Council and the Caribbean Telecommunications Council, leading organizations will conduct SUPERCOMM '92 seminars and bring you cutting-edge presentations. From the editors of Communications News to TES-M, Telephone, and Network World, you'll learn about the leading issues in your industry.

SUPERCOMM And ICC

Together offering you all the technical, non-technical and hands-on information you need to understand the telecommunications world of today and tomorrow.

New Matching Service Will Schedule Private Business Meetings At SUPERCOMM '92

Counterpart Business Matching Service will match and schedule companies for private one-on-one meetings at SUPERCOMM. Participating companies may choose the companies and the countries for the meetings. Meetings help SUPERCOMM companies expand sales, establish distributions or develop joint ventures in the U.S. or internationally. For more information and Counterpart registration forms, please contact Dr. Norine James, Executive Vice President, Counterpart. Phone: (703) 524-8704, Fax: (703) 524-8705.

Link To America's Future! Go To School! SuperSchool.

Learning has never been so much fun. See for yourself. Visit SuperSchool, SUPERCOMM '92's centerpiece sponsored by Ameritech. Play with interactive, hands-on displays that zing, whirr, bleep, transmit and print video, voice and information across the room ... or across the world ... in just nanoseconds. Get a handle on real technology that exists today - and see how it will work in the business world of tomorrow. Discover fresh new solutions to the contemporary learning process. Go to school. Ameritech SuperSchool.

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FREE ADMISSION EXHIBIT HALL ONLY

SUPERCOMM '92 International Exhibition

June 16 - 18 • McCormick Place • Chicago, IL

Visit hundreds of exhibits. See thousands of new products.

Tuesday, June 16: 9 am - 5 pm

Wednesday, June 17: 9 am - 5 pm

Thursday, June 18: 9 am - 3 pm

(No exhibits on Monday, June 15)

Exhibit Hours:

100 Level
SUPERCOMM
Sessions For Everyone:

Fri.
■ Primer

Monday
No Exhibits

Choose from more than 40 SUPERCOMM '92 non-technical seminars

- 8:00 - 9:00 a.m.
■ 9:00 - 10:00 a.m.
■ 10:00 - 11:00 a.m.
■ 11:00 - 12:15 p.m.
■ 12:15 - 1:30 p.m.
■ 1:30 - 2:45 p.m.
■ 2:45 - 4:00 p.m.
■ 4:00 - 5:15 p.m.
■ 5:15 - 6:30 p.m.
■ 6:30 - 7:45 p.m.
■ 7:45 - 9:00 p.m.
- 101 Synchronous Optical Networks - An Update
■ 102 Developing European Digital Cellular Market
■ 103 The Satellite Environment - User Needs
■ 104 Applications and Implementations of SONET
■ 105 Report Card on Developments in International Standardization Processes
■ 106 User Benefits/New Public Network Architectures
■ 200 - 215 p.m.
■ 410 Opportunities of CCS/SST
■ 108 Opportunities in the Asian/Pacific Telecommunications Market
■ 109 User Management of New Public Network Services
■ 230 - 4:45 p.m.
■ 110 Harmonious Hybrids in the '90s
■ 111 The Caribbean - Telecom Growth Market
■ 230 - 3:45 p.m.
■ 112 HDSL COPPER Value Just Went Up!

Grouped in three technical levels, the following are offered by ICC '92

200 Level
Sessions For Everyone:

300 Level
ICC Sessions

Tuesday
9 a.m. - 5 p.m.

- 8:00 - 9:00 a.m.
■ 9:00 - 10:00 a.m.
■ 10:00 - 11:00 a.m.
■ 11:00 - 12:15 p.m.
■ 12:15 - 1:30 p.m.
■ 1:30 - 2:45 p.m.
■ 2:45 - 4:00 p.m.
■ 4:00 - 5:15 p.m.
■ 5:15 - 6:30 p.m.
■ 6:30 - 7:45 p.m.
■ 7:45 - 9:00 p.m.
- 100 Numbering Resources: Who We Run Out?
■ 101 Where Will PCS & Cellular Meet in the Market?
■ 102 Managing Growth in Evolving Public Network
■ 110 - 12:15 p.m.
■ 110 Exploring Transition to Competition
■ 111 The Impact of Competition on On-Line Transaction Processing
■ 112 Money Matters: Fiber in the Loop - Part I
■ 230 - 2:45 p.m.
■ 310 Emerging Considerations for CCS/SST
■ 120 Introduction to Fast-Packet Switching - Part I
■ 121 Introduction to Fast-Packet Switching - Part II
■ 122 Access Restructure - What's at Play for Small Companies?
■ 123 Video Customer Premises Equipment
■ 124 Introduction to Fast-Packet Switching - Part II

- 8:00 a.m. - 12:30 p.m.
■ 200 ATM Services
■ 202 FTTx Network Migration Strategies
■ 207 - 215 p.m.
■ 205 ISDN Update
■ 206 ISDN Issues for FTTx Systems
■ 230 - 4:45 p.m.
■ 205 Near-Term IN Services
■ 206 Quality Issues in Network Operations and Management

- 8:00 a.m. - 12 noon
■ 301 Performance Analysis of Data Protocols
■ 302 Technology Issues of Wireless Communications
■ 303 Wave Technology Advances - Public/Private
■ 304 Optical Fiber Radio Filter
■ 305 Signal Processing for Digital Storage Systems
■ 306 Packet Switching
■ 307 Intelligent Networks and Integrated Network Management
■ 308 Management of High-Speed LAN/WAN Networks
■ 309 Multiservice TV
■ 310 CCMA for Personal & Mobile Communications
■ 2:00 - 5:00 p.m.
■ 311 ATM Switching and Broadband Networking
■ 312 ATM and Cellular Multimedia Systems
■ 313 Application of Signal Processing in Coding
■ 314 Communications Satellite Technologies
■ 315 Ganging Performance of Data Networks
■ 316 Ganging of Optical Fibers
■ 317 Specification Technologies for Softswitches
■ 318 Quality Management for Customer Satisfaction
■ 319 Rate Adaptive Coding and Decoding Algorithms for Personal Communications
■ 320 Ganging Models for Data Communication Networks
■ 320 Advances in Video and Image Processing

- 9:00 a.m. - 5:00 p.m.
■ 401 Broadband Networking
■ 402 Broadband Services and Industrial Applications
■ 403 - 5:00 p.m.
■ 404 Telecommunications Management Network - Principles, Models and Applications
■ 405 - 5:00 p.m.
■ 406 - 5:00 p.m. Signaling System Number 7 for Fixed Telephone and Mobile Networks
■ 12:15 - 1:30 p.m.
■ Awards Luncheon

- 9:00 a.m. - 12 noon
■ 321 Emerging IN Transition & Implementation Issues
■ 322 Impact of Multimedia Services on Protocols
■ 323 ATM and Broadband Coding
■ 324 Performance Enhancement in PCS Radio
■ 325 Dimensioning/Control of ATM Networks I
■ 326 High-Speed Transmission Technology
■ 327 ATM and Broadband Coding
■ 328 Land Mobile Satellite Communication Techniques
■ 329 Adaptive Filtering in Pulse Shaping & ISDN
■ 330 IPX: Switching and Interconnects
■ 2:00 - 5:00 p.m.
■ 331 PCS Radio Systems Engineering
■ 332 Progress in Broadband Switching Systems
■ 333 ATM and Broadband Coding II
■ 334 High-Speed Protocols
■ 335 Dimensioning/Control of ATM Networks II
■ 336 Network Control and Services Management
■ 337 in ATM Networks
■ 338 Issues in Wireless Communications Networks
■ 339 Propagation Effects in Satellites
■ A Communications
■ 341 Multimedia Communications for Cooperative
■ 342 High-Speed MANs
■ 343 Customer Evaluations

- 9:00 a.m. - 5:00 p.m.
■ 402 Broadband Services and Industrial Applications
■ 403 - 5:00 p.m.
■ 404 Telecommunications Management Network - Principles, Models and Applications
■ 405 - 5:00 p.m.
■ 406 - 5:00 p.m. Signaling System Number 7 for Fixed Telephone and Mobile Networks
■ 6:00 p.m.
■ Conference Banquet

* For technically oriented professionals and executives. Register early - space is limited.

Wednesday

9 a.m. - 5 p.m.

- 8:00 - 9:15 a.m.
Gathering Session
8:30 - 10:45 a.m.
128 The Basics of IN/IN
129 The Art and Science of PCIS Trial
127 Design and Learning: Minds Across Miles
11:00 a.m. - 12:15 p.m.
128 Accelerated Management of Infrastructure and Economic Benefits
129 Delivering Enhanced Services to the Customer
129 Looking Ahead: Fiber at the Loop - Part II
129 - 130 ATM and Synchronous Optical Network
131 MFC Number Portability
132 National Network Billing Services
133 New International Services for Corporate Users
1:30 - 4:45 p.m.
134 Interconnection Sharing - Services for Small Companies
135 Dial-up Videoconferencing When it's Ready?
2:30 - 5:15 p.m.
136 Auto Message Accounting Mechanisms

Thursday

9 a.m. - 3 p.m.

- 8:00 - 9:15 a.m.
137 QoS Issues for Small Telcos on Implementing Equal Access
9:30 - 10:45 a.m.
138 Perspectives on Advanced Intelligent Networks
139 Wireless Data Communications - Taking Users into the Future
140 Competitive Alternatives to the Local Loop
11:00 a.m. - 12:15 p.m.
141 Where the Rubber Meets the Road:
A User's View of Voice Processing Today
142 A User's View of Voice Processing Today
143 Preventing Network Outages

Please Note: Schedule Subject to Change

Locator/Hotel Map

- 1 The Standard Hotel
2 Hotel Washington
3 Hotel Pennsylvania
4 Chicago Hilton & Towers: ICC '91 HQ
5 The Congress Hotel
6 Hotel Roosevelt
7 The Drake
8 Radisson Suites
9 Radisson Hotel
10 Executive House
11 Grand Park Hotel
12 Grand Concourse
13 Holiday Inn City Center
14 Holiday Inn Mart
Place



ICC Feature Sessions

(Fee of Charge)

- 4:00: Quality Management for Customer Satisfaction
Monday, 2:00 p.m. - 5:00 p.m.

- 4:00: Global Information Architecture
Tuesday, 2:00 a.m. - 12 noon

Gigabit Networking Workshop

- Tuesday & Wednesday
8:30 a.m. - 5:00 p.m.
(Fee Required)
For more info, see back cover.

Help Us Help You

We want to make your conference our priority. But we can't do that alone. That's why in the PROCOMM '91 program, 102 sessions, 100 speakers, and other events you plan to attend, as we can make the best use of the available meeting space. To: Henry Winkler, Director, Special Events, SPECS, Inc., USA, 600 16th Street, NW, Suite 800, Washington, D.C. USA 20006-2180, Fax: (202) 825-3248. Thank you!

- 8:30 a.m. - 5:00 p.m.
403 Spread Spectrum Systemic Techniques
404 Broadband Applications of ATM
406 ISDN Services (ISDN Architectures, Technology and Applications)

Housing and Registration Information

Royal America is handling all housing arrangements. Its booth will be located in the Registration Area of McCormick Place. All housing questions should be directed to Royal.

Hotel Confirmations/Charges

Hotel reservation acknowledgments will be sent directly to you from Royal. Any hotel charges or cancellations must be made directly through Royal. Do not call the hotels directly. Hotel charges or cancellations can be made by mail, or fax 617/965-2729, Telex 413063 ROGALAM, or call 617/965-8000 or 1-800-553-0505.

Hotel Deposits

A hotel deposit is required for each hotel room/suite requested. The deposit must be submitted with the Official Housing-Registration Form. Forms are date-stamped and processed on a first-come, first-serve basis. All rooms must have a deposit in the amount of one night's lodging. The deposit may be in the form of a major credit card or a check payable to "Royal America, Inc." (The Oxford House accepts only a check or money order as deposit.)

Registration Deadlines

The SUPERCOMM '92 deadline is May 15, 1992. After this date, registrations for SUPERCOMM will not be honored, and you will not receive your badge by mail. Please register on site. ICC '92 registration will be accepted until one week before the conference. Housing will be available on a space-available basis.

SUPERCOMM '92 Registration

For SUPERCOMM '92 only, fill in the registration and housing information and mail with hotel deposit. Badges will be mailed (USA and Canadian addresses only) to all SUPERCOMM attendees, so please provide the complete correct mailing address for each registrant. You will receive your badge approximately 2 weeks prior to the show. If you do not receive your badge, please register on site.

Foreign badges will not be mailed. Please pick up your badge at the McCormick Place registration booth.

ICC '92 Registration

To register for ICC '92 sessions, please fill in the ICC '92 Registration Fees section in addition to the hous-

ing/registration information. Please include a check or payment for the ICC '92 sessions. Make checks payable to ICC '92. Important: If paying by check, separate checks for housing and registration fees must be sent. Payment in U.S. dollars only.

Discount Airline And Car Rental Information

American Airlines is designated as the SUPERCOMM '92 and ICC '92 preferred airline. To book your reservations, please contact Hennemot & Associates at 1-800-553-0505. American is also the preferred airline. Reduced airfares are offered on most airlines, so call early. If calling from overseas, (312) 236-6470; from Canada, 1-800-671-2386; or for your travel request to (312) 236-0377.

Please make sure to mention ICC '92 programs by showing Hennemot & Associates to handle your travel arrangements.

By doing so you will help our programs, and be eligible to win two free tickets in the continental U.S.

Airline: American
1-800-732-3222
1 Group 242434 - Rate Code G3
From Canada, 1-800-327-9633 or call
(305) 522-0000 for reservations.

Mail forms to: Royal America, Inc., SUPERCOMM '92 and ICC '92
313 Washington Street, Suite 300
Newton Corner, MA 02158

| Hotel | units | single | double |
|--|-------|--------|--------|
| 1 The Roosevelt Hotel | 150 | \$75 | \$95 |
| 2 The Roosevelt Hotel 160 N. Dearborn Drive | 150 | \$75 | \$95 |
| 3 The Shattock Hotel Michigan Ave. at State | 200 | \$95 | \$105 |
| 4 Chicago Hilton & Towers 222 S. Michigan Ave. ICC '92 Conference Room | 1000 | \$145 | \$165 |
| 5 Chicago Hilton & Towers 120 S. Michigan Ave. | 325 | \$205 | \$220 |
| 6 The Congress Hotel | 150 | \$95 | \$105 |
| 7 Days Inn | 150 | \$95 | \$105 |
| 8 Edgewater Hotel 66 W. Lake Shore Drive | 150 | \$115 | \$125 |
| 9 Embassy Suites 100 N. State Street | 100 | \$195 | \$215 |
| 10 Executive Inn 300 E. Michigan Avenue | 200 | \$105 | \$115 |
| 11 Executive House 71 E. Wacker Drive | 200 | \$125 | \$135 |
| 12 Forum Hotel 525 N. Michigan Ave. | 300 | \$155 | \$165 |
| 13 Holiday Inn (Best Western) 1160 S. Michigan Ave. | 150 | \$115 | \$125 |
| 14 Guest Quarters 1901 N. Bellflower Place | 150 | \$105 | \$105 |
| 15 Hotel Chicago Chicago City Center 300 S. Dearborn | 300 | \$125 | \$145 |
| 16 Holiday Inn Mart Plaza 260 N. Dearborn Street | 300 | \$112 | \$125 |

| Hotel | units | single | double |
|--|-------|--------|--------|
| 15 Hotel International 525 N. Michigan Ave. | 200 | \$105 | \$120 |
| 16 Hotel Nitro 202 N. Dearborn | 200 | \$105 | \$115 |
| 17 Hotel Metropac 100 N. Dearborn | 200 | \$105 | \$115 |
| 18 The Enviro-Blocker Walton Plaza at Michigan Ave. | 150 | \$105 | \$115 |
| 19 The Lenox Hotel 520 N. Dearborn Street | 150 | \$105 | \$115 |
| 20 The Plaza 541 N. Michigan Ave. | 150 | \$145 | \$155 |
| 21 McCormick Center Hotel Lake Shore at 2nd Street | 500 | \$105 | \$125 |
| 22 The Oxford Hotel 222 S. Michigan Ave. | 100 | \$105 | \$115 |
| 23 Palmer House Hilton 1 E. Monroe Street | 100 | \$115 | \$125 |
| 24 Remondi, Lake Shore 4000 S. Lake Shore Drive | 150 | \$75 | \$85 |
| 25 The Renaissance Hotel 102 E. Ontario Street | 100 | \$115 | \$125 |
| 26 Sheraton Chicago 301 N. Dearborn Street | 700 | \$105 | \$115 |
| 27 Sheraton Plaza 100 W. Madison | 100 | \$105 | \$115 |
| 28 Sofitel-Riviera One W. Wacker Dr. | 200 | \$115 | \$125 |
| 29 The Transient 100 E. Chestnut St. | 50 | \$105 | \$115 |

Advance Registration/Housing Form

(Whether or not you use hotel accommodations, you need to fill out this form)

Last Name _____

First Name _____

Nickname for Badge _____

Company Name _____

Street Address _____

Room #/MS/Serial _____

City _____

State _____ Zip _____

Telephone _____

Fax _____

Industry Affiliation _____ (Use number from #1 below)

Professional Responsibility _____ (Use letter from #2 below)

IEEE Membership Number _____

Is your company a member of J USTA J TIA

Name of Spouse/

Guest for Badge _____

Are you requiring housing? J YES J NO

HOTEL PREFERENCE

First Choice _____

Second Choice _____

Third Choice _____

Please check how your choice was made: J Rate J Location

All rooms must have a guarantee in the amount of one night's lodgings. You may guarantee your room with a major credit card or a check payable to Royal America, Inc. (The Oxford House accepts only a check or money order after deposit.)

Hotel Room Type Requested (Single or Double) _____

1. INDUSTRY AFFILIATION

Choose ONE category that best describes your industry affiliation. (Also enter on form above under address)

Exchange/Carriers/Subscribers Hotel/Motel

Legal/Insurance/Business Estate Legal/Publishing

Manufacturing & Development Media/Entertainment

Trade Shows/Conventions Centers Retail/Wholesale/Resale

Utilities (Gas/Water/Electrical)

Government Transportation/Regulatory

Military Foreign

Press Consulting

Spouse/Child (non-industry) Education

Independent Other Companies Manufacturing

Long Distance International

Mobile/Cellular Medical/Healthcare

CATV/Video/FM Defense/Space Providers

Telephone Manufacturers Broadcast Services

Data Communications Services Consulting Services

Consultants & Architects Research & Development

Financial & Leasing Companies Satellite Communications

Data Processing/Information Systems Manufacturers

Data Communications Services Telecommunications Associations

Television News Educational

Financial/Investment Manufacturing

Religious/Health Care Other

2. PROFESSIONAL RESPONSIBILITY

Choose ONE that best describes your professional responsibility. (Also enter on form above under address)

Consulting Services Human Resources

Customer Relations Marketing/Customer Service

Network Operations Research & Development

Broadcast/TV Sales/Marketing

Transmission Manufacturing

Cable & Wire Mobile/Cellular Operations

Support Services Fiber Optic Operations

Other

METHOD OF PAYMENT (Registration and Hotel)

Check Enclosed separate checks for ICC '92 registration and hotel deposit
 \$ _____ for ICC '92 Registration \$ _____ for Hotel Deposit

VISA MasterCard American Express

\$ _____ for ICC '92 Registration \$ _____ for Hotel Deposit

Credit Card # _____ Exp. Date _____
 Signature _____

Registration Fees For SUPERCOMM '92 Seminars And Exhibitions Is FREE

REGISTRATION FEES FOR ICC '92

IEEE, IESTA, or TIA MEMBER REGISTRATION

1. Full - Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet

2. LIMITED - Includes all Sessions, Exhibits, Banquet

3. 1-DAY - Includes all Sessions, Exhibits (Circle one: MON TUES WED)

4. LIFE MEMBER - Includes all Sessions, Exhibits, Banquet

NONMEMBER REGISTRATION

5. FULL - Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet

6. LIMITED - Includes all Sessions, Record

7. 1-DAY - Includes all Sessions, Exhibits (Circle one: MON TUES WED)

OTHER

8. SERIES 200 SESSIONS ONLY, Exhibits

9. STUDENT - Includes all Sessions, Exhibits

OPTIONALS (In addition to fees included in Registration Fee above)

A. Tutorial #1 - Broadband Networking (Monday all day)

B. Tutorial #2 - Broadband Services (Tuesday afternoon Applications) (Circle # of days)

C. Tutorial #3 - Spread Spectrum Systems (Wednesday all day)

D. Tutorial #4 - Satellites (ISON) (Wednesday all day)

E. Tutorial #5 - Telecommunications Management Networks (Monday morning)

F. Tutorial #6 - Signaling System #7 for Fixed & Mobile Networks (Tuesday afternoon)

G. Workshop #1 - Network Synchronization (Tuesday morning)

H. Workshop #2 - Technology Management (Tuesday afternoon)

I. Gigabit Networks Workshops (Monday and Wednesday)

J. Awards Luncheon (Monday) CITY _____ 35 40 K

K. Conference Banquet (Tuesday) CITY _____ 50 55 L

M. Addl. Conference Record CITY _____ 70 75 M

N. Shipping Cont. Record (To hotel street address - USA only) CITY _____ 15 15 N

FEATURE SESSIONS

O. Feature Session Workshops for Customer Satisfaction (Monday afternoon)

P. Global Information Architecture (Tuesday morning)

SOCIAL EVENTS

Q. Chicago Highlights/Dinnerware CITY _____ 5 25 30 G

R. Monday Night at the Museum CITY _____ 50 55 H

S. Highlights, Chicago's Gold Coast (Tuesday morning) CITY _____ 24 28 S

T. Cooking Demonstration (Tuesday afternoon)

U. Art Auction (Tuesday evening)

V. Mobile/Cellular Operations (Wednesday morning)

W. Fiber Optic Operations (Wednesday morning)

X. Other

TOTAL REGISTRATION

Must be in US Dollars (No refunds for cancellations after May 25, 1992)



Telecom/MS Managers: Don't miss Network World's four SUPERCOMM seminars on new public network architectures and services, ISDN applications and new international services for end users. Also, half a dozen other seminars ranging from user needs and concerns, private/public network management, and information services to video services, wireless data communications, and network reliability. All seminars feature panel format, Q&A and no charge to attend.

**Attend Gigabit Networking Workshop
For Private Network Administrators**

The applications, architectures, and business impacts of ultra high-speed digital networking will be thoroughly examined in a special, informal and in-depth workshop on June 16-17 especially developed for senior-level managers/administrators of private networks.

Co-sponsored by IEEE's Communications Society, USTA, and TIA, the 8:30 am - 2 pm technical program features a theme speaker, two panel discussions, and a luncheon speaker each day. Subject matter ranges from network applications/architectures, and experiences to economics and benefits.

Free access to the SUPERCOMM '92 exhibition by 450 manufacturers and suppliers—including many demonstrating applications of broadband solutions available today—is included in the \$225 registration fee (\$395 after May 25). Free access to SUPERCOMM seminars and to high-speed networking and other key sessions at the co-located ICC '92 is also included.

Pre-register using the form on the previous page of this brochure—line 1. Or call (312) 782-8397 for additional information. Seating will be limited for this in-depth private networking workshop, so please act promptly.

A Special Thanks!

... to *Telephony Magazine* and *Network World*—official publishers for SUPERCOMM '92 and ICC '92. Watch for important information-packed brochures inserted in the March 2 and April 6 issues.

Telephony

NETWORK WORLD

Need More Information?

For Non-Technical Programming:



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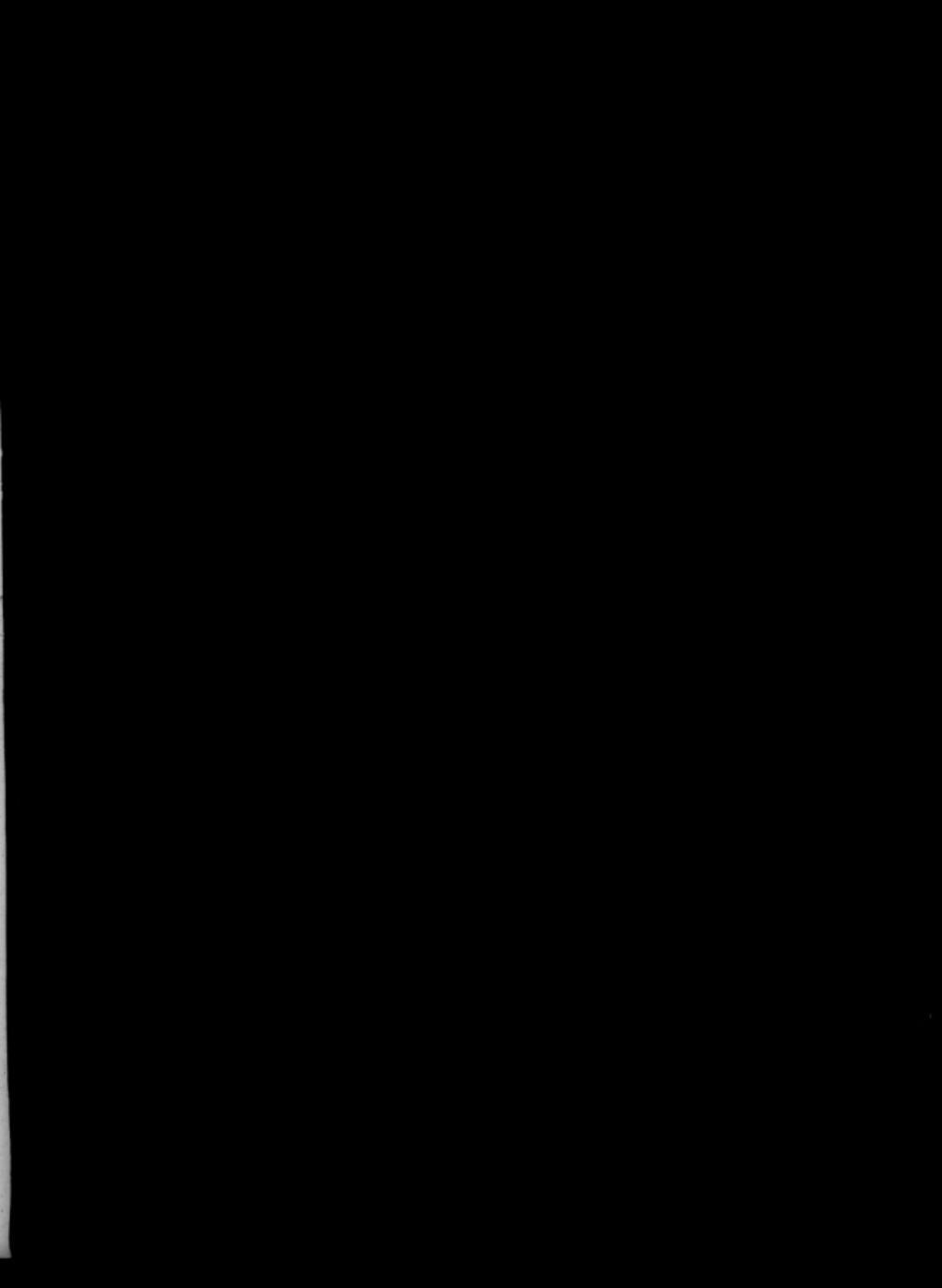
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PRODUCT SPOTLIGHT

LAN management

There are thousands of things that need to be managed on interconnected LANs, from hardware to protocols to administrative tasks

BY BOB JANUSAITS

With all the talk of downsizing, you may have started to look into the tools available to manage a local-area network-based environment. What you've probably found is a lot of network monitors, many protocol analyzers and several intelligent wiring stations, or smart hubs.

All three categories notify the LAN administrator of crucial network problems. In fact, smart hubs address the estimated 60% of network-related problems that occur at the cable or network interface card level. Protocol analyzers and monitors address the other 40%, such as packet storms and improper protocol implementation, which occurs at the protocol level (see story page 94).

But there's a lot of day-to-day management and administrative information that those products completely bypass. For instance, a protocol analyzer may tell you that there's trouble at a particular bridge or router, but it doesn't tell you where that bridge or router is.

The holes in available LAN management products are apparent when you compare available tools with mainframe-related offerings, such as Goal Systems International, Inc.'s OPS/MVS, IBM's Netview and Digital Equipment Corp.'s Management Control Center.

However, while there is no comprehensive tool set that addresses all LAN management issues (see list of comprehensive functions, page 93), third-party developers are beginning to address some key areas, such as the following:

- Configuration documentation.
- Inventory.
- Backup.
- Hardware monitoring.
- Virus prevention.
- Software metering.

Janusaitis is a certified Network engineer and a certified IS auditor. He is responsible for the LAN Auditing and Disaster Recovery practice at Business Systems Group Consulting in Houston.

Most of the products in these categories work across multiple networks. However, the majority operate only in the Novell, Inc. Netware environment, although several products specific to Banyan Systems, Inc.'s Vines, Apple Computer, Inc.'s AppleTalk and Microsoft Corp.'s LAN Manager are also available. Only a few products have begun to operate with multiple operating systems.

LAN DOCUMENTATION

Documentation is an area people love to ignore, mostly because it's perceived as requiring an enormous amount of time and energy. The fact is, you should know at any given moment what you have on the LAN, especially if the network fails.

Documentation or configuration products can reduce the time and effort of documenting a LAN to less than several hours. They track LAN components specific to the file server, including hardware components — such as disk drive configurations, volume names and network interface cards — and software components, such as memory address information, server directory structures and user security information.

Network Management from Fyrite Computer Systems, Inc. provides the most plentiful documentation in this group of products. In product tests, it took less than three hours (including printing) to gather three 3-in. binders full of documentation, amounting to approximately

2,000 pages of information, including server hardware configuration, directory structure of the file server, user names and trustee assignments.

Network Management, which is Netware-specific, is easy to install, has a suggested retail price of \$495 and essentially pays for itself the first time it is used. Multiple servers may be licensed.

query to see only the files bigger than 1MB byte on the system. This feature is particularly useful on file servers with a large number of users or a complex directory structure.

In the Vines' environment, Trellis Software, Inc.'s Expose not only documents the system but also monitors performance, assists in problem resolution and provides a network map. Because it is so comprehen-



Mark S. Klein

A less robust but more focused product is BindView (\$395) from The LAN Support Group, Inc. While it does not provide operating statistics, it does provide a more focused view of the network for users who don't want to sift through hundreds of pages of information.

For example, you can filter a

view, it is also expensive — \$1,250 per server plus \$2,995 for the monitor software.

LAN INVENTORY

LAN inventory products are similar to documentation products in that they provide the LAN administrator with essential information about the LAN makeup. However, they work at the client, or workstation, level to report on such things as the type of CPU, amount of disk space, what DOS version or network shell is being used, CONFIG.SYS files, AUTOEXEC.BAT files, disk drive size and *Continued on page 93*

INSIDE

What's New in Monitors?

Analyzers, monitors have seen lots of advancements. Page 94.

Buyers' Scorecard

Openview tops user ratings of enterprise-wide managers. Page 96.

Product Guide

A comprehensive list of inventory management tools. Page 98.

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Managing interconnected LANs

CONTINUED FROM PAGE 91

A listing of software.

Some products provide only hardware information, such as Horizons Technology, Inc.'s LAN Auditor. LAN Auditor operates on Netware, Vines and LAN Manager. A Microsoft Windows version is also available. It costs \$495 for the first 100 nodes and \$295 for each additional 100 nodes.

Frye's LAN Directory, although Netware-specific, goes beyond LAN Auditor to inventory software and permit custom reporting. It costs \$495 for the first 50 nodes and \$395 for each additional 100 nodes.

Neither product requires a terminate-and-stay-resident program, so you don't have to worry about memory problems. And both can run at any time — each time the user logs in, if desired.

In the Apple Macintosh environment, Macvek U.S.A. recently released NetOctopus network management software, a comprehensive tool that manages hardware inventories, site license agreements and software upgrades.

BACKUP & RESTORATION

LANs are most vulnerable when it comes to data backup. According to Maynard Electronics, Inc., a vendor of backup products, only 17% of LANs are backed up on a regular basis.

Every LAN should have tested backup and restoration procedures. There should be backup not only for the server but also for the individual workstations.

Most tape backup software is relatively unintelligent and requires the LAN administrator to maintain a log or otherwise manually keep track of tape rotation. As larger disk drives emerge, however, a fundamental change in the way we perform backup is required. With upwards of 200 bytes now available on a server, it is not reasonable to do a full backup every evening.

This has brought about the necessity for products that back up data on an incremental basis — for instance, a nightly backup of files that have been changed.

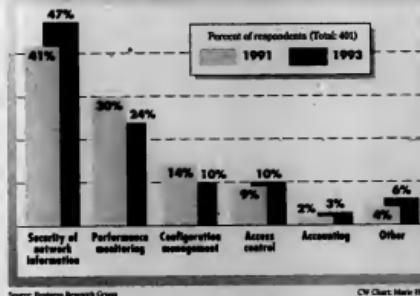
While several products have that capability, Palindrome Corp.'s The Network Archivist (TNA) includes software that

manages those files intelligently. TNA addresses storage management, archiving, tape rotation and backing up nodes on the network. It is easy to install and operate and restores files rapidly.

Although it is not as easy to use as TNA and is incapable of tape rotation, Maynard Electronics' Maynstream is the

Management priorities

Based on a study of 401 LAN administrators, security is and will continue to be the top concern for managing LANs



CW Chart: Marc Hansen

only product on the market that permits the owner of a file to back up or restore his own files without LAN administrator intervention. It also backs up nodes and provides archiving.

Other manufacturers of tape systems include Emerald Systems, Inc. and Mountain Network Solutions, Inc. Both provide basic backup features such as tape cataloging and node backup.

HARDWARE MONITORING

One area that network monitors generally don't track is the server. Consequently, some vendors now offer hardware monitors, which allow the LAN administrator to set specific parameters for servers — such as maximum and minimum volume

space — to ensure the LAN server is operating within its limits.

Early Warning System (\$495) from Frye notifies LAN administrators of server-based problems before they become critical. Notification can come in the form of electronic mail, pager, voice and fax. The system can also be programmed to archive files if the volume exceeds the threshold.

Monitrix from Cheyenne Software, Inc. also provides hardware monitoring,

there are only two products on the market that are server-based virus protectors. SiteLock from Brightwork Development, Inc. operates as a Netware Loadable Module or value-added process. It costs \$995 per server and can also inhibit unauthorized execution from local workstation drives.

Untouchable Network from Fifth Generation Systems, Inc. uses a proprietary algorithm to accomplish the same goal. It costs \$695 for a 10-node starter kit and an additional \$85 per node.

SOFTWARE METERING

Software metering products are an inexpensive way of proving you're in compliance with software copyright laws.

Most software license agreements is not a particularly popular issue. But while very few companies have installed software metering products, the issue of copyright adherence looms large.

Several products provide software metering by requiring the LAN administrator to enter the total number of licensed copies per server into the metering software database.

Connect Computer Co.'s Turnstyle (\$395) checks its database as a file that is about to be executed. If the execution of the file would cause the number of licensed users to be exceeded, the product notifies the user that the application is not available.

Turnstyle operates with Netware, Vines and LAN Manager in either terminate-and-stay-resident or batch mode.

Brightwork Development's SiteLock (\$995) operates as a Netware Loadable Module and places the user in a queue if the application is not available.

A lot of growth is expected in all these areas of LAN administration and management, to the point that comprehensive systems management may well grow beyond the scope of today's mainstream tools. Expert systems will play a large part in relaying the LAN administrator of the mundane, but essential tasks of day-to-day LAN management.

Vendors of all the components — network operating systems, protocol and packet analysis, smart hubs and LAN administration — need to combine efforts to integrate their information. That would be comprehensive LAN management. *

The following is a list of components that should be included for comprehensive LAN management coverage:

► LAN documentation and inventory. Essential LAN documentation includes LAN policies and procedures, hardware configurations, cabling diagrams, service contracts and purchasing procedures.

► Hardware maintenance and monitoring. This should include preventive maintenance logs, an inventory of spare parts, upgrades of hardware components and monitoring hardware.

► Mission-critical systems. You need to identify mission-critical systems and steps to recover them.

► Operating system maintenance. Procedures are necessary to ensure that patches to the operating system are loaded on a timely basis. You also need controls to ensure that operating system maintenance does not impact performance.

Full coverage

► Security, virus and software metering. Security should address the file server, workstation hardware, log-on access and classification of data sensitivity on local-area and network drives. This includes virus prevention/detection and compliance with software licensing agreements.

► Fire protection. This includes prevention, detection and suppression methods.

► Backup and restoration. Every LAN needs tested backup/restoration procedures. These include a rotation schedule for off-site tapes, security for the tapes and review of backup procedures for workstations and backup software.

► Business resumption planning. It is critical to have an up-to-date, tested disaster recovery/business resumption plan.

► Network design/performance. This includes network implementation guidelines and, on large LANs, a protocol analyzer to determine performance bottlenecks.

► Help desk, problem resolution. A properly staffed and trained help desk needs to be functioning, with adequate resources to provide assistance to clients.

► Administration and setup. Procedures should be established to ensure that the LAN is administered in accordance with management's mission.

► Training. All personnel involved with the LAN should be properly trained.

► Vital records. Off-site storage of vital company records is crucial, including magnetic media, manuals and procedures to ensure that company operations can continue without interruption in the event of a disaster. This may include electronic vaulting.

Monitors, analyzers seek trouble — with a twist

BY JILL HUNTINGTON-LEE

If you haven't shopped for a local-area network monitor or analyzer lately and you're expecting a dull lineup of black boxes that do pretty much the same thing, you may be in for a surprise.

Last year's blitz of new and enhanced products created a new climate in the LAN analysis market — with technologies ranging from expert systems to distributed architectures.

LAN analyzers and monitors are being used by the many organizations that have yet to invest in enterprise-wide management solutions, such as Sunet Manager from Sunconnect (a division of Sun Microsystems, Inc.) and HP Openview from Hewlett-Packard Co. (See Buyers' Scores card, page 96).

Whereas enterprise-wide systems continuously poll devices throughout the network for status information, LAN monitors are passive devices that can collect data on both Simple Network Management Protocol (SNMP) and non-SNMP nodes. Once a monitor detects a problem

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area, a LAN analyzer is often brought in for in-depth problem diagnosis.

The most popular LAN monitoring gear can be divided into three categories: high-end protocol analyzers, LAN segment or traffic monitors, and software-only monitoring utilities (see chart page 95).

High on the Net

At the high end, protocol analyzers such as SuperNet from Network General Corp. in Mountain View, Calif., and Novell, Inc.'s Lansalyzer deliver maximum functionality but can easily cost \$20,000 or more. The best analyzers support a wide variety of protocols and can decode all seven layers of the Open Systems Interconnect model, from faulty cables or network interface cards (at the physical layer) to software bugs (at the application layer) to bridges and routers (at intermediate layers).

The latest trend in high-end analyzers, according to Mark Miller, president of Diginet Corp., a consulting firm in Denver, is to roll LAN and metropolitan- and wide-

area network capabilities into one box. "These analyzers can diagnose network problems on both sides of the link," Miller explains, "such as Token Ring on the LAN and [Synchronous Data Link Control] on the WAN."

On the ultra-high end, Wandel & Goltermann, Inc. in Research Triangle Park, N.C., has designed the DA-30 analyzer for large heterogeneous networks. The DA-30 allows users to simultaneously test two network segments with different topologies — for example, Ethernet LAN

area this year.

In lieu of an expert system, Novell includes preprogrammed tests and "applications that are easy to modify," says Robert Burrell, LAN administrator at Ethicon, Inc., a subsidiary of Johnson & Johnson in Somerville, N.J. Burrell uses Lansalyzer to display IPX protocols for network-layer debugging.

Adding RISC

Expert systems and other ease-of-use features require added power. To that end, a recent trend among vendors is to add reduced instruction set computing (RISC-based processors, which not only support faster decodes but also enable machines to preprocess raw data into more concise, useful information.

One such product is Trakker, unveiled this past summer by Concord Communications, Inc. in Marlboro, Mass. Trakker uses RISC-based monitors to preprocess and correlate protocol and traffic data before displaying it in real time. It also collects data across distributed networks and reports back to central console software. Trakker supports limited protocol analysis but is much easier to use than traditional protocol analyzers.

At Concord Computer Corp., Trakker has allowed monitors to be assigned to monitors, freeing up engineers for other tasks. "No other analyzer keeps the kind of historical data that Trakker does," says Mike Pate, manager of engineering networks. "And with the real-time capability, I don't have to try to recreate problems in order to debug them."

LAN segment monitors

If the typical \$20,000 to \$35,000 protocol analyzer price tag strains your budget, less expensive traffic monitors can provide some help. LAN segment monitors are hardware-based tools that typically cost from \$3,000 to \$10,000.

Traffic monitors do not decode protocols, but they can provide summary statistics that indicate performance trends or bottlenecks. You'd need a protocol analyzer to diagnose the problem. Monitors are often purchased to meet a specific need. "Some users just want to find out what the peak traffic periods occur each day," Miller says. Other users are attracted to monitors because they are easier to use than protocol analyzers.

However, networks tend to grow

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Michael S. Ross

and RS-232 — to view what's happening in real time on both sides of the junction.

Expert systems

Nothing beats one of these high-end protocol analyzers — as long as you can figure out how to use it. But because of the expense and difficulty of hiring experienced technicians, it's not surprising that the phrase "expert systems" is now a buzzword in the analyzer market.

Because they are notoriously difficult to implement, there are very few products that incorporate expert systems on the market today.

One of the few (and the first) to announce a LAN analyzer with an expert system component is HP, which incorporated Fault Finder in its Network Advisor in May 1990. Fault Finder suggests causes of network anomalies and makes recommended solutions. While expert systems are notoriously slow and buggy, Fault Finder represents a key step toward making analyses easier to use.

Network General has promised to follow suit with its own expert system for

When to use what

The new functions on network monitors are not for everyone. Here's some suggestions for when they are best put to use.

► **Expert systems:** Human expertise unavailable or too expensive to obtain.

► **RISC-based processing:** Monitoring high-speed networks, building complex networks and/or stress-testing. Possible future support for expert systems.

► **Low-end software:** For single-segment LANs with homogeneous make-up; possibly supplement to protocol analyzers; ease of use is a prime consideration.

► **Simultaneous LAN/WAN analysis:** Building and/or maintaining complex, heterogeneous networks with a mix of topologies, anticipated changes in network size and protocols used.

► **Distributed architecture/remote monitoring:** Continual monitoring required on critical LAN segments (where any downtime at all is catastrophic); geographically dispersed LAN where trained personnel are at central site to work.

► **Rmon MIB support:** User organization is committed to open systems/enterprise-wide SNMP implementation.

JILL HUNTINGTON-LEE

Hey man, it's Rmon

There's something called the Rmon MIB that's making its big splash in traffic monitors lately. It all started when traffic monitors started being incorporated more and more into SNMP management stations. The SNMP station provides the sophisticated graphical user interface that most monitors lack. For their part, monitors obtain traffic statistics and other data from non-SNMP devices that the SNMP station may not pick up during routine polling cycles.

MIBs, or "management information bases," come into the picture when the monitor needs to share the information it collects with the SNMP station. The monitor must first translate the collected data into SNMP format and deposit it into the MIB, which the SNMP station can read.

While MIBs are proprietary by their very nature, some vendors release their MIB definitions to other vendors to market product combinations. For example, Novell has provided its Lantron MIB to no less than 14 SNMP management vendors in the past 18 months.

The LANCE+ management system from Lencos in Nutwood, Calif., uses the Lantron MIB to gather traffic data and then present digested information in the form of graphical

charts and reports.

In this way, SNMP has helped cut through the messes of managing heterogeneous networks. However, the proliferation of different MIBs has created headaches for LAN administrators. A device's MIB may contain anywhere from 50 to 4,000 different measurements, called "variables."

Enter Rmon. The Internet Engineering Task Force, which oversees SNMP standards development, is working to create standard MIBs in several product areas. The first of these efforts to approach finalization is the remote monitoring — or RMON — MIB, which defines a basic set of variables that all LAN monitors can support.

"The Rmon MIB will make the marketplace more organized and will help users make better price/performance comparisons," explains Michael Eringer, Lencos' director of networking and chairman of the Rmon MIB Working Group.

"We're beginning to clean up the inconsistency between metrics supported by various vendors — and we're talking about thousands of metrics," agrees Koenig Terpil, an international network management consultant at Performance Navigation, Inc. in Hackensack, N.J., and Munich.

JILL HUNTINGTON-LEE

more complex as they evolve — and more likely to develop problems requiring in-depth diagnostic information that monitors can't deliver. Fortunately, new hybrid tools, such as Concord's Trakker, are beginning to bridge the gap between fault detection and diagnosis.

Distributed architectures

At both the midrange and the high end of the market, analyzers and monitors with distributed capabilities have been pegged

as godsend by LAN administrators. Because these products can monitor diverse networks — even at remote locations — they can cut down on expensive in two ways: less travel and less downtime.

Most major vendors — including Network General, Novell, Spider Systems, Inc., Protocols, Inc. and HP — have introduced distributed architectures in which permanently attached probes run continuously, forwarding alarms and other data to a central console.

"Before we bought [Spider's] Spiderprobe, it was not uncommon for me to get a call at 4 p.m. and be on location at midnight debugging the remote LAN," says an engineer at a major financial services company. The user, a technical support engineer, is responsible for multiple network sites in several states.

"After installing Spiderprobe last year, I've cut down most of the traveling and prevented downtime as well," he continues. "Now, I look at the probe output on a regular basis and can see if a LAN card is bad; I tell the local administrator to pull it out, and we avert a major broadcast storm."

Low-end monitoring

At the lowest end of the market are software-only monitoring utilities. These products range from Ethernet tools that capture and display packets in real time (such as Walnut, Calif.-based Avant Garde Group's Etherpeak) to software packages that keep tabs on Novell servers, such as the popular Frye Utilities from Frye Computer Systems, Inc. in Boston.

Not just a "poor man's monitor," these products are capable of triggering alarms on server status and collecting data that the more expensive products don't track. But Frye is now considering Frye Utilite to implement the capabilities of its Novell Lanalyzer. "It's possible to monitor servers with Lanalyzer, but Frye Utilite will trigger an alarm when a server drops out of the network — that's what I need."

Some users of single-segment and homogeneous LANs rely strictly on low-price utilities for performance data. However, many users who start out with software-based Ethernet monitors often upgrade to faster, hardware-based systems as network needs evolve. Documentation, service and support are sometimes minimal with the lowest priced monitors.

With new product features appearing every month, the wide variety of equipment can create problems for prospective customers.

"Purchasing the wrong tool is worse than not buying anything at all," cautions Chuck Haggerty, a senior analyst at DataPro Information Services Group in Delran, N.J. "Users should evaluate the different types of equipment available before selecting a vendor."

High and low

There are breakdowns for every kind of LAN

High-end: Protocol analyzers

Provide detailed layer-by-layer breakdown of LAN packets via English-like descriptions of protocol decode; filters and applications help users pinpoint exact cause of corrupted data, excessive traffic or other anomalies.

Price range: \$10,000 to \$30,000

Market leaders: • Hewlett-Packard Colorado Springs
Network Advisor, HP 4972A

• Novell Lanalyzer Division San Jose, Calif.
Lanalyzer

• Network General
Mesa Park, Calif.
Sniffer, Distributed Sniffer

Midrange: LAN segment monitors

Collect traffic statistics (total packets, bytes, errors; most active stations, most active protocols); help in network planning, such as detecting overloaded segments before disaster occurs, buying traffic to implement alternate or added routes.

Price range: \$3,000 to \$10,000

Market leaders: • Hewlett-Packard Colorado Springs
Lansprob

• Novell Lanalyzer Division
San Jose, Calif.
Lantern

• Spider Systems
Burlington, Mass.
Spidermonitor, Spiderprobe

Low-end: Software-only activity monitors

Provide various selected statistics (traffic, frame size distribution, server status) and some rudimentary and/or partial protocols. Limited in speed and power. Typically unable to keep up with traffic on busy networks or complex internets.

Price range: \$300 to \$3,000

Market leaders: • Avant Garde Group Walnut Creek, Calif.
Etherpeak, Net Alert

• Cheyenne Software
Rushville, N.Y.
Meastrix

• Frye Computer Systems
Boston
Frye Utilities

• Network Computing
Dallas
Lanalert

SOURCE: Frost & Sullivan Network Associates

CW Chart: Marc Nelson

'92: The Year of Cutting Through Hype

BY MARC DODGE



I just had a terrible thought: Since 1987, every year has been proclaimed "The Year of the LAN." Now that that's over, will pundits proclaim each year of the '90s as "The Year of Network Management?"

For United Parcel Service and most everyone else, managing a multivendor LAN or WAN environment is interesting at best, and vast challenges to that predicament aren't likely for two years, if any. All of us can continue to build our own network management systems using one or more pieces from each vendor. This means multiple consoles, lots of training and anxious network managers.

There's no better way to explain than to look at reality. UPS' corporate IS group has a campus of six buildings. Managing the LAN backbone connecting the buildings requires multiple network management systems, so the help desk has separate consoles to monitor the following elements:

- Individual LAN performance (from Novell).
- Intelligent LAN wiring hubs (from Synoptic Communications).
- Gateways linking the LANs to the host (from Novell).
- Bridges and the backbone tying the LANs to each other (from IBM).

And this just covers the campus. The WAN or telecommunications network requires another half dozen systems and consoles. Throw in a few protocol analyzers, wire scanners and network management software utilities, and the "system" is complete.

This is the way it is for most of us. Fortunately, it works, and it will be adequate until the promise of integrated network management systems (INMS) is delivered — probably in 1994 or later.

At the same time, we realize things must change within two or three years.

UPS plans to build its own INMS by 1994 by writing software to link its network elements to a vendor's core INMS. This year, the data transport elements of the WAN will be built into the INMS, including the multiplexers, switches and modems. In 1993, the LANs, bridges and routers will be added.

The final unibuild system will include a single database and single graphical user interface. Most of the LAN and WAN network will be visible from one workstation. Parts of the management will be decentralized and available from anywhere within the network.

There is more smoke and fog in network management than in any other area of information technology. If we understand that true INMSs are at least two years away, we can plan accordingly. At the very least, we won't fall for "The Year of Network Management" rhetoric.

Dodge is manager of the telecommunications network management group at UPS in Mahwah, N.J.

BUYERS' SCORECARD

Openview satisfaction rises; Sunnet's declines

BY DEREK SLATER
CWT STAFF

Companies seeking software to control their local-area networks can buy a collection of products from different ven-

dors to provide discrete management functions, or they can purchase a network management platform that offers various functions through a mixture of modules. If they select the latter route, there are few choices.



LAN management software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: Openview: 34; Sunnet Manager: 24; Netview: 40.

| Product | Highest ratings | Lowest ratings |
|----------------------------|---|--|
| Hewlett-Packard's Openview | Responsiveness of vendor service Quality of technical support Ease of use | Ability to manage traffic on modems and multiplexers Security management Providing accounting information |
| Sun's Sunnet Manager | Value for the dollar Quality of technical support Graphical user interface capability | Ability to manage traffic on modems and multiplexers Training time required Ability to manage other vendors' equipment |
| IBM's Netview | Responsiveness of vendor service Ease of use Quality of technical support | Support for other vendors' SNMP extensions Ability to manage other vendors' equipment Security management |

Among the three products that have emerged as market leaders in this field — Hewlett-Packard Co.'s Openview, Sun Microsystems, Inc.'s Sunnet Manager and IBM's Netview — HP's Openview received the highest satisfaction ratings from its users in a survey conducted earlier this month.

In last year's Scorecard on LAN management (CW, May 27, 1991), Openview shared top honors with Sunnet Manager, scoring 69 points overall. Users rated Openview higher this year (71), while Sunnet Manager fell to 64 overall. Users rated Sunnet Manager lower this year than last in three of the five most important categories.

As a result of Sunnet Manager's five-point drop, the mean score fell from 66 last year to 65. IBM's Netview, like Openview, gained two points.

Users' priorities have also changed over the past year. The importance of a product's ability to manage large networks changed most significantly. The category ranked sixth overall with an importance rating of 7.8, compared with a 7.3 rating last year.

Each user group rated only its own products, assigning a 1-to-10 rating for each category area, with 10 being very good. Overall scores were derived by multiplying the mean ratings each user group gave its product by the mean importance factors assigned to the criteria by all respondents. Scores were then converted to base 100. The response base for the survey was 34 for Openview, 24 for Sunnet Manager and 40 for Netview.

Openview earned the top score in 13 categories this time around, including five of the six areas users rated as most important: responsiveness of vendor service, quality of technical support,

overall ease of use, value for the dollar and ability to manage large networks. HP's technical support and responsiveness of service both earned ratings of 8.0, its highest marks. In several categories Openview scored well above its competitors.

Low-scoring areas for Openview were security management (6.0) and management of traffic on modems and multiplexers (5.5), although users rated the latter as the least important criterion in the survey.

Overall, Openview users reported a high level of satisfaction with the product; all 34 users surveyed said they would purchase Openview again.

The second-place finisher, Sunnet Manager, tied for first in one category: providing accounting information. The product also ranked fourth in importance of the six key ratings. Four of the users said they would be unlikely to purchase it again, citing difficulty of use and lack of diagnostic power.

Precisely low grades in integrating with other vendors' products hurt IBM's Netview, which finished third overall. Netview users assigned it a 5.1 rating in managing other vendors' equipment and a 4.7 for its support of other firms' Simple Network Management Protocol extensions. These scores offset Netview's first-place grade in fault tolerance and troubleshooting (6.8). Netview also ranked second in three of the six key categories: responsiveness of service, ease of use and ability to manage large networks.

Netview's highest scores were in responsiveness of service (7.3), quality of technical support (6.9) and ease of use (6.9). It outscored its rivals comfortably in management of data traffic on modems and multiplexers (6.5). ■

KEY RATINGS

HP's Openview takes top honors in five of the six most important categories, according to users, including the No. 1 area of concern: responsiveness of vendor service. IBM's Netview places first in the remaining area, fault tolerance and troubleshooting, while earning second-place marks in three other areas.

User importance rating →

8.4 Responsiveness of vendor service



8.3 Fault tolerance and troubleshooting



8.1 Quality of technical support



8.0 Overall ease of use



7.9 Value for the dollar



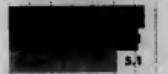
7.8 Ability to manage large networks



A CLOSER LOOK

Sun's SunNet Manager scored second-place finishes in six of 11 areas, tying for second in three others. Openview placed first in all categories but two.

User importance rating:

7.3 Performance management and capacity planning**7.2 Training time required to use product****6.9 Security management****7.7 Configuration management****7.3 Ability to manage other vendors' equipment****7.0 Support for other vendors' SNMP extensions****6.6 Providing accounting information****7.4 Ability to manage traffic across bridges and routers****7.2 Mapping ability****7.0 GUI capability****6.4 Ability to manage traffic on modems and multiplexers****Verbatim**

What do you like best/worst about this product?

(Responses are based on the most frequently stated answers)

Likes
Ease of use
Flexibility
Reliability

Dislikes
Poor service/support
Poor diagnostics
Lack of flexibility

Likes
Ease of use
Low cost
Flexibility

Dislikes
Not user-friendly
Poor diagnostics
Difficult learning curve

Likes
Flexibility
Had good experiences with it
Ease of use

Dislikes
Lack of flexibility
Not user friendly
No graphical interface

Loyalties

How likely would you be to purchase this product again if you were making the decision today?
(Percent based on most frequently stated responses)

Response base: 34

34 — Likely
The reason: Reliable product

Number of respondents

20 — Unlikely
The reason: Cost/Performance ratio

Number of respondents

34 — Response base: 40
Likely
The reason: Reliable product

Number of respondents

Vital statistics

Total number of respondents: 96

What is your position?

| | |
|----------|----|
| Manager | 61 |
| Staff | 18 |
| Director | 12 |
| Other | 7 |

How many years have you been using this product?

| | |
|----------------------|----|
| More than five years | 8 |
| Four to five | 11 |
| Two to three | 37 |
| One or less | 42 |

What is your responsibility for LAN management?
(Multiple response allowed)

| | |
|--|----|
| Evaluate or recommend vendors | 85 |
| Set standards for organization | 73 |
| Determine need | 71 |
| Select vendors | 69 |
| Approve or authorize purchases | 45 |
| Establish purchase agreements with vendors | 44 |
| Buy for user departments | 43 |

How many nodes are on the network managed by this product?

| | |
|---------------|----|
| More than 500 | 15 |
| 401-500 | 4 |
| 301-400 | 0 |
| 201-300 | 7 |
| 101-200 | 19 |
| 51-100 | 16 |
| 1-50 | 32 |
| No response | 5 |

METHODOLOGY

To qualify for Computerworld's Buyers' Scorecard on local-area network management, a product had to have more than 200 installed sites and be comparable in features and functions.

The survey was based on random samples of users drawn from numerous sources. The response base was 40 for IBM's Netview, 34 for Hewlett-Packard Co.'s Openview and 24 for Sun Microsystems, Inc.'s Sunview Manager.

Frost & Sullivan Research in Austin, Texas, conducted the telephone survey and tabulated the results.

The total weighted scores were computed by multiplying the mean scores across group all criteria by the mean scores each user group gave its own product. Ratings are presented in order of importance based on these mean importance ratings.

WISH LIST

Respondents said they would like to see the following features added to their products:

- Openview: more flexibility to interface with other vendors, better diagnostics, better database capabilities and improved overall network management.
- SunNet Manager: better database capabilities, better diagnostics and better overall management.
- Netview: more flexibility to interface with other vendors, graphical display capability, better diagnostics and better system upgrade capabilities.

Users said they obtain the following benefits from the products: better diagnostics, trouble-shooting, easier access to the LAN and good user interface for LAN management.

One-third of the 96 respondents manage 80% to 100% of their LAN equipment through these products.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance in preparing the Buyers' Scorecard: Jeff Case, SHMP Research, Inc.; Tom Dakin, Weston, Inc.; Bill Huntington-Lee, Datapac Research Group; David Pomeroy, Ernst & Young Center for Information Technology and Strategy.

LAN inventory management products

| VENDOR | PRODUCT | PRODUCT TYPE | COMPATIBLE NETWORKS | COMPONENTS INVENTORIED | CONFIGURATION FEATURES | IDENTITIES SERVER-BASED PROFILES | HARDWARE REQUIRED | OPERATING SYSTEM REQUIRED | RAM REQUIRED (BYTES) | DISK SPACE REQUIRED (BYTES) | USER INTERFACE SUPPORTED | NETWORK INTERFACE SUPPORTED | PRODUCT IS USED IN BACKGROUND | | RUNS CUSTOMIZED REPORTS | | RUNS REPORTS SIMILAR TO YOURS | | OTHER COMPATIBLE PRODUCTS FROM VENDOR | PRICE |
|--|------------------------------|--|---|--|--|----------------------------------|---|------------------------------------|------------------------------|------------------------------------|----------------------------------|--|-------------------------------|-----|-------------------------|-----|-------------------------------|-----|---|--|
| | | | | | | | | | | | | | Y/N | Y/N | Y/N | Y/N | Y/N | Y/N | | |
| AG Group, Inc. (314) 857-7600 | Net Watcher | Inventory management, configuration management | AppleTalk | CPU type, network interface card, software on the server and workstation, number of users, user profiles, other network components | Switch problems, port problems, configuration problems, port assignments | Y | Macintosh | Mac OS | 1M | 4M | GUI, menu, text, command line | Ethernet, Token Ring, FDDI, ATM, ISDN, X.25, PPP, AppleTalk | Y | Y | Y | Y | Y | Y | Switch, Workstation, LAN Card | \$195 (network license) |
| | NetWatch | Configuration management | Novell Netware, LAN Manager, Netware 3.x | Network addresses, traffic flow over time | Traffic monitoring, port monitoring, traffic analysis and configuration management | Y | Macintosh | Mac OS | 2M | 1M | GUI, menu, text | Ethernet | Y | Y | Y | Y | Y | Y | Switch, Workstation, LAN Card | \$195 (network license) |
| | NetWatch | Configuration management | AppleTalk | Network addresses, network interface cards, traffic flow | Network addresses, traffic monitoring, traffic analysis | Y | Macintosh | Mac OS | 1M | 1M | GUI, menu, text | LocalTalk | Y | Y | Y | Y | Y | Y | Switch, Workstation, LAN Card | \$410 (network license) |
| | NetWatch | Configuration management | Novell Netware, LAN Manager, Netware 3.x, Netware 4.x | Network addresses, traffic flow, disk space | Network addresses, traffic monitoring, traffic analysis, disk space, LAN statistics, memory, memory usage, memory utilization | NP | Macintosh | Mac OS | 2M | 1M | GUI, menu, text | Ethernet | Y | Y | Y | Y | Y | Y | Switch, Workstation, LAN Card | \$795 (network license) |
| Blue Laser, Inc. (713) 688-1387 | LT Auditor | Inventory management, configuration management, LAN 1.0 | Novell Netware | CPU type, amount of memory, disk space, network interface card, software on the server and workstation, number of users, user profiles, other network components, disk space, the access, LAN statistics, memory, memory utilization | Switch problems, port problems, configuration changes | Y | IBM PCs and compatibles | DOS | 10M (works stand alone) | 1M (varies) | GUI, character based | Ethernet, TCP/IP, Token Ring, all Novell-compatible protocols | Y | Y | Y | Y | Y | Y | LT Server, LT Agent | \$800 per server |
| Brightwork Development, Inc. (609) 520-0440 | LAN Inventory 2.0 | Inventory management, configuration management | Novel Netware | CPU type, network interface card, software on the server and workstation, number of users, user profiles, other network components, disk space, memory, memory utilization | Macintosh and PC workstations, disk drives, memory, memory utilization | Y | IBM PCs and compatibles, Macintosh, Macintosh II | DOS, Mac OS | 200M | 1M | All Novell-compatible protocols | Ethernet, Token Ring | Y | Y | Y | Y | Y | Y | LAN Server, LAN Agent | \$100 per server |
| CSC Technologies (412) 473-5770 | Network Supervisor 2.0 | Inventory management, configuration management, network management | AppleTalk | CPU type, network addresses, software on the server and workstation, number of users, user profiles, other network components, disk space, memory, memory utilization, user profiles, amount of memory | Network control, control, topology, traffic flow, bandwidth, drive mappings, amount of memory, memory utilization, user profiles, amount of memory | Y | Macintosh | Mac OS | 2.5M | 4M | Mouse and text | Ethernet, Token Ring, AppleTalk | Y | Y | Y | Y | Y | Y | Network Server, Network Supervisor 4.0, Network Supervisor 5.0, Network Supervisor 6.0 | \$450 for 25 generic ports; \$715 for 50 generic ports; \$1,295 for 140 generic ports or more |
| Frye Computer Systems, Inc. (417) 324-2700 | LAN Directory Version 1.0 | Inventory management, configuration management, LAN 1.0, diagnosis | OS/2-based PC network | CPU type, network addresses, software on the server and workstation, number of users, user profiles, other network components, disk space | Common reporting | Y | IBM PCs and compatibles, Macintosh | DOS, Mac OS | 540K | 1M and above | Text editor, spreadsheet program | Ethernet, TCP/IP, Token Ring, Novell Netware, Novell Netware 1.1, Novell Netware Early booting, Novell Netware 1.2 | Y | Y | Y | Y | Y | Y | All PCs, Novell Netware, Novell Netware 1.1, Novell Netware 1.2, Novell Netware Early booting, Novell Netware 1.3 | \$400 (includes license for 50 generic ports and services); \$200 for 25 generic ports and services; \$100 devices |
| The Graphic Management Group, Inc. (314) 788-7100 | The Graphic Master | Inventory management, configuration management | Novell Netware | CPU type, network addresses, software on the server and workstation, number of users, user profiles, other network components, disk space | Integrated drawing, database | Y | IBM PCs and compatibles | DOS, Mac OS | 640K | 4M | Mouse and text | NA | Y | Y | Y | Y | Y | Y | Graphic Data Manager | \$1,495 per node or server |
| Horizon Technology, Inc. (619) 265-6200 | LAN Audit | Inventory management, configuration management | Novell Netware, Business Class, Microsoft LAN Manager | CPU type, network addresses, software on the server and workstation, number of users, user profiles, other network components, disk space | DB2 status, AUTOEXEC.BAT, CONFIG.HTS, PROFILE.DAT, AUTOEXEC.BAT, CONFIG.HTS, PROFILE.DAT, AUTOEXEC.BAT, CONFIG.HTS | Y | IBM PCs and compatibles, DOS, Windows 3.0 (Windows 3.0) | DOS, DOS/Windows 3.0 (Windows 3.0) | 40M | 1M | GUI, menu and text | Ethernet, Token Ring, Arcnet | Y | Y | Y | Y | Y | Y | LAN Server, LAN Manager, Microsoft LAN Manager, BAC2, BAC2 Enhanced Edition | \$1,495 includes support for 50 PCs, \$200 for 25 generic ports and services, \$100 PCs |
| IBM (800) 426-3466 | IBM LAN Management Version 2 | Inventory management, configuration management, LAN 1.0, diagnostics, fault management | IBM LAN Server | CPU type, network addresses, software on the server and workstation, number of users, user profiles, print queue, memory, memory utilization, user profiles, amount of disk space, disk utilization, IPX/SPX statistics, workstation connections | Relational database, change log, alert on change | Y | IBM PCs and compatibles | DOS, Mac OS | 13M, 16M, 20M, 25M, 30M, 40M | 1.2M, 1.6M, 2.0M, 2.5M, 3.0M, 4.0M | Common file, query manager | Ethernet, Token Ring | Y | Y | Y | Y | Y | Y | LAN Server, LAN Manager, Microsoft LAN Manager, BAC2, BAC2 Enhanced Edition | \$400 per server |
| Total Corp. (800) 375-2200 | LAWizard Version 2.10 | Inventory management, configuration management | Novell Netware | CPU type, network addresses software on the server and workstation, number of users, user profiles, print queue, memory, memory utilization, user profiles, amount of disk space, disk utilization | Remote control of the LAN | Y | IBM PCs and compatibles | DOS | 5M | 20M | GUI, X Window, menu and text | All Novell-compatible interfaces | Y | Y | Y | Y | Y | Y | Switch, Workstation, LAN Card | \$200 per server |
| Macross USA (313) 666-0006 | Macross | Network administration tool | Novell Netware, Banyan Vines | CPU type, network addresses software on the server and workstation, number of users, user profiles, print queue, memory, memory utilization, user profiles, amount of disk space, disk utilization | Install, delete, update files across the network, track downtime | Y | Macintosh | Mac OS | 1.5M | 8M | GUI | Ethernet, Token Ring, AppleTalk | Y | Y | Y | Y | Y | Y | Switch, Workstation, FDDI, SCSI | \$645 (includes 845 per node) |

*Under review. **ISO = internetwork requests. ***Other alternative solutions.

Saber Software Corp., (214) 381-8000, which responded late to appear in the chart, offers LAN Administrator Architecture: Saber LAA Agent Toolkit (\$495/server) and Saber LAA Console/WT (\$495/server).

The response included in this chart is based on a recent survey conducted by Computerworld. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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| VENDOR | PRODUCT | PRODUCT TYPE | COMPATIBLE NETWORKS | COMPONENTS INVENTORY | CONFIGURATION MANAGEMENT FEATURES | IDENTITY SERVER-BASED PROBLEMS | HARDWARE REQUIRED | OPERATING SYSTEM REQUIRED | MAIN MEMORY (BYTES) | DISK SPACE REQUIRED (BYTES) | USER INTERFACE SUPPORTED | NETWORK INTERFACE SUPPORTED | PRODUCT IS USED IN BACKGROUNDS | BASIC CUSTOMIZED REPORTS | BASIC REPORTS SIMULTANEOUSLY | OTHER COMPATIBLE PRODUCTS FROM THIS VENDOR | PRICE |
|--|------------------------|-------------------------------------|---|--|--|--------------------------------|----------------------------|---------------------------|---------------------|-----------------------------|---|---|--------------------------------|--------------------------|------------------------------|--|---|
| Midway Networks Ltd. (408) 976-2342 (408) 941-1200 | Ring Manager II | Inventory, configuration management | Novell Networks, Novell Netware, Novell Shop | Network addresses, software on the server and network, number of memory, number of drives, number of users, number of disk drives | Identify specific hardware, software, and disk drives on the server and network; provides number of memory, number of drives, number of users, number of disk drives | No | IBM PCs and compatibles | DOS, OS/2, Macintosh | 640K | 1MB | GLX | Telnet, RJE | Yes | Yes | Yes | Adonis, Bridge | \$1,000 (hardware per workstation); \$1,200 (server) |
| Magix Enterprises, Inc. (404) 440-0411 | Network 2.0.1 | Inventory management | Novell Networks, Novell LAN Manager, Novell Netware, Novell Shop | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives | Identify hardware, software, and disk drives | No | IBM PCs and compatibles | DOS, Macintosh | 640K | 1MB | GLX | Any which the network operating system supports | No | Yes | Yes | None | \$100 for 100 workstations; \$175 for server |
| Thomson, Inc. (403) 243-3300 | LANReady | Configuration management | Novell Networks | Network addresses, software on the server and network, number of memory, number of drives, number of users, number of disk drives | Server configuration reporting, identifying specific components | Yes | IBM PCs and compatibles | DOS | 612K | 1MB | Mouse and keyboard support | All Macintosh, Novell, Novell Netware, Novell LAN Manager | Yes | Yes | Yes | LANworks, LANReach | \$400 per server |
| Kernow Management, Inc. (404) 980-1100 | Sysplex | Inventory, configuration management | Any Windows-based networks | Any information that can be gathered from input files, logs | Build status and track WYSIWYG (what you see is what you get) reports, monitor world map with ability to zoom in | No | IBM PCs and compatibles | DOS, Macintosh, 2.0 | 1MB | 2MB | GLX, mouse and keyboard | Ethernet, TCP/IP | Yes | Yes | Yes | GroupWise | \$400 per node |
| NetBridge Networks, Inc. (703) 554-3400 | SNMP Manager | Configuration management | Novell Networks, any Ethernet | Any SNMP variable | Data and reference configuration management | No | IBM PCs and compatibles | DOS | 640K | 2MB | Mouse and keyboard support | Ethernet, TCP/IP | No | Yes | Yes | None | \$100 (hardware per workstation); \$1,000 (server) |
| | SNMP Manager | Configuration management | Novell Networks, any Ethernet | Any SNMP variable in any LAN device | Data and reference configuration management | No | Data, Macintosh, Net-Scape | 1MB | 2MB | 10MB | GLX | Ethernet, TCP/IP | No | Yes | Yes | None | \$100 (hardware per workstation); \$1,000 (server) |
| On Technology, Inc. (401) 576-4000 | StorageMac | Configuration management | Any AppleTalk-based network | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives | Plan-to-operate forward scheduling, resource contention, user-controlled scheduling, interface to database manager, move ADP to new ADP by specifying priority | Yes | Macintosh | Mac OS | 2MB | 2MB | Mouse and keyboard | Ethernet, Token Ring | Yes | Yes | Yes | None | \$400 for 250 users; \$1,100 for 1,000 users; \$1,500 for our network manager |
| Preferred Systems, (800) 459-3113 | Orion Version 1.0 | Configuration management | Novell Networks | User profiles, user and group configuration rights, Novell security | Logical server and network management | No | IBM PCs and compatibles | DOS | 640K | 2MB | GLX | All DOS-based servers | No | No | No | PeopleSoft | \$100 per server |
| Technology Works (404) 940-7400 | Circle Line Manager | Configuration management | AppleTalk | Software on the server and network | Update software on the server and network | No | Macintosh | Mac OS | 2MB | 2MB | Mouse and keyboard | Ethernet, Token Ring, LocalTalk | Yes | Yes | Yes | Other CircleLine products | \$250, single user; \$400, unlimited |
| | Circle Network Manager | Configuration management | AppleTalk | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, price, location of disk space, price, location of printer | Provides a more complete view of hardware, software and network | No | Macintosh | Mac OS | 2MB | 2MB | Mouse and keyboard | Ethernet, Token Ring, LocalTalk | Yes | Yes | Yes | Other CircleLine products | \$400 for 50 users |
| | Circle Network Info | Configuration management | AppleTalk | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, price, location of disk space, price, location of printer | Data base system to store products or conflicts in and out of network and to provide centralized solutions | No | Macintosh | Mac OS | 2MB | 2MB | Mouse and keyboard | Ethernet, Token Ring, LocalTalk | Yes | Yes | Yes | Other CircleLine products | \$400 for 50 users; \$1,100 for 1,000 users |
| | Circle Active Manager | Inventory, configuration management | AppleTalk | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, price, location of disk space, price, location of printer | Provides a central storage facility to store products or conflicts in and out of network and to provide centralized solutions | No | Macintosh | Mac OS | 2.5MB | 6MB | Mouse and keyboard | Ethernet, Token Ring, LocalTalk | Yes | Yes | Yes | Other CircleLine products | \$800 (network version) |
| Transcom Corp. (714) 531-0400 (800) 531-0400 | Check It LAN | Inventory management | Novell Networks | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, price, location of disk space, price, location of printer | Identify checks, IPL, NTLA, DOS and Novell Netware verifications | No | IBM PCs and compatibles | DOS | 612K | 1MB | PC card | Windows, DOS, and Novell Netware compatible computers | Yes | Yes | Yes | PC Test | \$200 for the server; \$100 for 20 workstations; \$900 for 100 workstations; \$1,200 for 1,000 workstations; \$1,500 for 5,000 workstations |
| Teltronics (510) 555-0772 | Argus | Inventory, configuration management | Novell Networks | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, price, location of disk space, price, location of printer | Identify hardware, software, drivers, and disk drives | No | IBM PCs and compatibles | DOS, Windows 3.0 | 540K | 540K | Mouse and keyboard | Ethernet, TCP/IP, Token Ring, SNMP | Yes | Yes | Yes | None | SNAL (single network version); SNAD (multiple network version) |
| Thales (404) 976-0430 | Vision | Inventory, configuration management | Novell Networks, Novell Netware, Novell LAN Manager, Novell Netware, Novell LAN | CPU type, network addresses on the server and network, number of memory, number of drives, number of users, number of disk drives, number of printers, number of scanners, number of disk space, up to 400 fields of configuration and verification | Mounts hardware, software, drivers, and disk drives by PC | No | IBM PCs and compatibles | DOS, Windows 3.0 | 2MB | 2MB | GLX, mouse and keyboard, DOS, and Novell Netware compatible computers | Ethernet, TCP/IP, Token Ring, SNMP | Yes | Yes | Yes | None | \$1,000 (network version) |

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IN DEPTH

Getting to know U(sers)

A quick quiz can reveal the depths of understanding — or misunderstanding — between users and IS



George Cohen

BY DENNIS VANVICK

The relationship between the information systems staff and the user community can be illustrated by a forced marriage. Neither party asked for the union, but both must live with it.

Until that day of bliss when IS and users will live in complete, integrated, cross-functional harmony, there are going to be some interactions that will make sparks fly. No matter how much lip service is paid to the notion that the data belongs to the users, there still

exists in many IS shops an "us against them" mentality. Why? It's a simple misunderstanding of roles: the cause of the problem?

In many cases, yes. User managers often view IS departments as a black hole into which they pour their profits, with little business results. They don't get their systems on time, and they don't understand how the IS department works. IS managers look at functional departments as demanding too much too soon without a complete appreciation of the role IS plays in the firm. They can't get their systems out on time, and they don't understand how the user department works.

QUIZ INSTRUCTIONS

- ① Interpret each statement as a stand-alone situation. There is no relationship among the various scenarios.
- ② If the statement is not relevant to your environment, simply skip it. Your score will not be affected.
- ③ Answer each question according to this scale: I sympathize...
A. With the user B. With IS C. With both D. With neither
- ④ Circle only one answer per question.
- ⑤ Compare your answers with the key at the end of the quiz, and determine your score and rating.

Even small misunderstandings can lead to poor communication and bad blood between the two groups. Such acrimony can damage the functioning of the corporation. For example, without synergy, a development project can go over budget and cause the firm to miss a key business opportunity.

As the IS manager, you have to spearhead efforts to increase understanding of one another. Don't wait until things get bad; take action regarding the IS/user relationship before it goes sour.

Finger-pointing and personal attacks not only are unprofessional but also get you nowhere, so you'll need to find other ways to determine whether there is cooperation or disunity in your company. One nonthreatening way to do this is to give IS and user staffs an informal test to gauge the depth of the problem in your organization.

The basic premise of the test is to present a series of typical dialogues between users and IS, asking those taking the quiz to indicate which party they sympathize with and why. What they answer will hopefully show their understanding of the sometimes contentious but always symbiotic IS/user relationship. (See questions below.)

Don't forget to take the quiz yourself. You'll want to gather the answers and use the findings as a starting point for a meeting between IS and users. The goal is to get problems into the open and correct them.

Please keep in mind that this is not an all-encompassing study and is written by an IS person. While bias may be embedded in the questions or answers to this quiz, it honestly attempts to be objective.

Roll up your sleeves and dig in:

SCENARIO 1

User manager: Our chargeback expenses are astronomical. Sky-high salaries on the IS side don't help the situation.

IS manager: I'm sorry you feel that way, but our salaries are market-driven. We pay the salaries we have to pay to attract good people — as your department does. We should sit down and discuss your chargeback expenses. They are based on the time that our people and hardware devote to your priorities.

Circle one answer: I sympathize...
A. With the user B. With IS
C. With both D. With neither

Continued from page 103

SCENARIO 2

User manager: System development time is always quite a bit more than you estimate. Why? Why can't we ever get a system on time? What are we doing wrong?

IS manager: It's simple — you are continually changing requirements. The system we are developing today is not the same as the system we began developing last month. You have to be more careful at the front end in gathering systems requirements. The more time you spend gathering requirements for the system, the less time it will take to code, test and maintain the system.

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 3

User manager: You and your machine are still expensive burden to the corporation. You don't produce revenue — only expense.

IS manager: C'mon, you know better than that. We are the nerve center of the company. We provide a valuable resource to the company — information.



SCENARIO 4

User manager: Our response time is terrible! Screen-to-screen response time averages about 10 seconds. It's unacceptable for our business.

IS manager: Of course — there are too many users on the system. Either we restrict the number of users, or you will have to stagger the work hours of your people to lessen the load on the system.

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 5

User manager: Instead of waiting for the new system, we've purchased a personal computer package and are going ahead with implementation plans. The package meets our needs perfectly. We won't have to bother you at all.

IS manager: That's fine with us as long as you don't need any help from us.

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 6

User manager: We need your staff to perform a small modification to the open

purchase order inquiry display.

IS manager: It's going to take a long time. The programmer who wrote that particular program left the company, and no one else understands it very well.



SCENARIO 7

User manager: Your department should report to the chief executive officer. IS reporting to the financial manager is an archaic structure and has caused a lot of problems. Let's face it — you have a vested interest in providing support to finance and putting the rest of us on hold. You should report to the CEO, the same as I do.

IS manager: You put me in a difficult position and one that I don't have the power to change. Why don't you talk to the CEO?

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 8

User manager: The CEO tells me IS will not approve the purchase of any equipment other than IBM's. What is the reason for this? We want to buy Hewlett-Packard Co. printers because they are much quieter than IBM's.

IS manager: In the interest of uniformity and standardization, we want all the computer equipment in the company to come from one vendor. The uniformity simplifies billing, maintenance and support. Besides, IBM is the largest computer company in the world. IBM is a "safe" purchase.

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 9

User manager: IS never meets its deadlines.

IS manager: That's because you set them based on your needs, with no regard for our available resources. We should have the freedom to set our own schedules.

Circle an answer: I sympathize...
 A. With the user
 B. With IS
 C. With both
 D. With neither

SCENARIO 10

User manager: We've been looking at ways to move up the target date on our marketing software project and want to talk to you about the possibility of deferring much of the user documentation until after implementation. This way, you can shift the people who are doing the user

documentation over to coding. My employees can critique and add to the documentation after we go live.

IS manager: We think the user documentation should be written as we progress with the system. We feel strongly about this and will argue for an extension of the target date before we agree to defer the documentation. We can still plan on a critique and modifications by your staff. In fact, we encourage it.



If participants come back from taking this quiz and their eyes aren't bloodshot or their fists clenched, take that as a good sign. Now, here's how you and the other test takers should have responded and why.

Scenario 1: B. Give the information systems manager points for a factual and empathetic response. The user should not bring up salaries as a point of contention. That is more of a personal attack than a valid point.

The real issue is the chargeback costs, and the IS manager's offer of explaining how chargebacks work starts in solving this conflict.

Having an inaccurate and therefore inequitable chargeback system will frustrate users and damage IS' relationship with them.

To obtain buy-in and increase IS credibility, you should involve users in the development of a chargeback package. They should be given access and an explanation about the amount they are billed.

Scenario 2: B, or C. Both departments should shoulder blame for incomplete requirements gathering because it is a joint responsibility. Possible points to the user manager here, because in asking what his group is doing wrong, he is at least taking some of the responsibility for the problem.

More time should be spent on the front end of the systems development cycle, and once the IS group recognizes this fact, it should convince the user community of it as well. Studies have shown that it takes one hour to correct a bug in the design phase and approximately eight hours to correct a bug in the postimplementation phase.

Can users afford to wait a full day while you fix a payroll processing application that has come down with a bug? You have to help users understand the importance of front-end investment in terms of time and cost.

Scenario 3: B. Maybe the idea of IS as the "nerve center" is a bit much, but information is a valuable resource, and the user is too antagonistic in presenting his case here.

The fact remains, however, that if the information systems department was doing its job — providing accurate, immediate information so that the user could do his work — then users would regard it as a key function. Providing better decision-making impacts the bottom line and turns IS from revenue drain to revenue enhancer.

Scenario 4: A. Ten-second screen-to-response time is intolerable, and the user has a right to be rankled. Here, the IS manager's response is not at

all analytical. He puts all the blame and the burden of a solution on the user, without any offer to analyze or help with the problem. The IS manager should listen to the user's plight — poor response time prevents people from doing their jobs, for which they are held responsible. The user is in crisis here, and his problem should be addressed immediately and efficiently. Think of how that will improve your image with users companywide.

Scenario 5: D. Maybe this is a trick question. The user is so obviously at fault for making purchasing plans without consulting IS that it may overshadow IS' shortcoming. IS is too readily willing to accept the fact that users are forcing ahead on their own without investigation into what such autonomy would mean. Think how crazy things could get if users start needing interfaces or add-ons or support for systems they selected without IS input.

A cross-functional management steering committee is an excellent setup that keeps IS apprised of what users are doing and gives users some flexibility in hiring contractors or purchasing certain third-party software. The committee could police these types of purchases, including gauging what kind of installation, troubleshooting and follow-up support might be required.

Scenario 6: A. The fact that the departure of a programmer has left the IS staff in such a precarious position, unable to meet the needs of users and, by extension, the company, indicates that there is a deeper, more serious problem here. There may be poor documentation and control through the entire system or the entire department, with little sharing of knowledge and few people on the big picture.

The wonder in a company like this is how any system got implemented at all or how any of them are useful to the business. If the IS chief has inherited this mess, he should immediately start an investigation of poor documentation to correct the problem. In a situation as dire as this one, there's no time to waste.

Scenario 7: B. The IS manager's corporate protocol is above reproach. Reporting structure is not something he should be discussing with the user manager. However, if the user is unhappy because he feels support is inadequate, the IS manager has to deal with that resentment, perhaps even by suggesting to his superiors a change in the reporting structure.

It may be better for the information systems department to report to a committee of functional managers to avoid any appearance of bias.

If the reporting structure cannot be changed, it may be worth working with the finance department to set up a system in which IS addresses departmental needs by standards such as timeliness, strategic importance and availability of IS staff. The IS manager should make this priority list freely available.

Scenario 8: A. This is an antiquated, logical mentality — vintage 1960s, when "you couldn't get fired for buying IBM." An IS manager who responds in this manner will soon be left behind — or without a job.

Stipulating information systems billing, maintenance and support are not reasons to put a system in.

The overriding factor should be what is best for your users and your business.

Continued on page 107



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Continued from page 104
within your budget limitations.

This IS chief must have been in hibernation for at least the last decade. Otherwise, he might have heard that uniformity is no longer the domain of proprietary systems.

Many technologies enable multivendor, heterogeneous connections. Putting in place an evaluation system that includes a variety of vendors could help this relationship immensely.

Risky business

How can misconceptions between information systems staff members and users be taken care of?

Here's what some IS thinkers say:

Increase contact between warring parties. Stereotypes persist because of ignorance. Dispersion — the act of putting IS people closer to their clients — is one way to improve a bad situation.

At one company we studied in which the IS/user situation was particularly bad, IS was moved into the business units. Perception changed. In fact, one senior business manager said, "You know what's interesting about the IS guys? They tend to be really smart."

Not only do stereotypes disappear, but IS is often valued for its ability. We've found that in dispersed companies, there's a marked increase in IS movement from the technical end into business positions.

Thomas Lodal
Cognitech Services Corp.
Easton, Conn.

Develop an integrated methodology for doing IS work in the organization. This plan goes something like this:

- Make sure IS staffers understand they do client-based work.
- Qualify the client. Develop a full range of background on the business group you're working with. Know its basic computer competence level. Know its business and how workers can do better.
- Do not deal with any problem in isolation. Three levels of development must happen concurrently for good IS/user relations: people development, business development and technology development.
- Operate as if no project is ever completed. Stay close to the user at all times.
- Develop a climate for change. Set up a process of continual evaluation, recommendation, development and upgrade for both "human" and technical systems.

Vicki McConnell and Karl Koch

Co-authors

*Computerizing the Corporation:
The Intimate Link Between People
and Machines* (Van Nostrand
Reinhold, New York, 1990)

Scenario 9: D. It is difficult to synthesize with either party here. Why isn't the IS department setting its own priorities and schedules?

The formation of a steering committee made up of user department heads, the CEO and the information systems manager could improve the interaction between users and IS.

This committee could determine over-all IS priorities as they apply to the business. IS could then assign staff and technology resources to take care of those priorities as well as report scheduled milestones back to the committee. No one would be surprised by missed target dates because IS would keep a record of why a date was missed.

Scenario 10: B. The IS manager

gets the vote because he realizes that documentation is lost, forgotten or never completed if not dealt with in an ongoing fashion.

The scenarios presented in this piece are certainly not meant to be an exhaustive representation of problems between users and IS departments, but they'll clue you in to some major areas of misunderstanding.

By knowing what to expect — and how to make your relationship with users a more open, productive one — you can develop harmony in your union. *

Vaswick is lead analyst of information systems and data processing at 3M International Operations in St. Paul, Minn.

QUIZ SCORING

To score the quiz, divide the total number of correct answers by the total number of questions answered to get a percentage.

IS respondents with a poor score get one week in a user-re-education camp where acronyms are prohibited. User managers get one week in an IS re-education camp where acronyms are the only means of communication.

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COMPUTER INDUSTRY

NATIONAL BRIEFS

Ups and downs

► The mainframe, midrange systems and personal computer segments of the computer industry declined the most in revenue during 1991, according to a worldwide computer system market share survey completed by San Jose, Calif.-based Datquest, Inc. What's left? Try workstations: With 14.5% 1991 growth, the often Unix-driven, open-systems-oriented speedsters are the frequent flyers of the computer industry, according to Datquest.

Ready for prime time

► Industry observers who have noted that a new era of vigilance in financial matters might also mean a new level of attention paid to accountants will find some support for their theory in the agenda for the Information Technology Association of America's spring conference. The software industry association formerly known as Adapco will feature CFO Day: a first-time, all-day program for chief financial officers of software companies.

Sterling consolidates

► In search of gains in efficiency and effectiveness, Sterling Software, Inc. consolidated operations at two of its 14 divisions, merging the Dylakor and the Answer Systems Divisions. Sterling, a \$224.4 million software company, has pursued a growth-by-acquisitions strategy since the early 1980s.

Filenet imaging stays ahead of pack

BY ELLIS BOEKER
CW STAFF

COSTA MESA, Calif. — Once upon a time Filenet Corp. was a scrappy little up-and-comer getting its feet wet in the promising new document imaging market. Today, said Ted Smith, Filenet's founder, president and chief executive officer, the market is no longer "the coming thing" — it's here. And Filenet, according to analysts, has arrived as well.

"I see a lot of signs, large and small, that [imaging] is a broadly recognized systems-level technology," Smith said. Unlike in the early days, when he was a traveling apostle of the concept, "a lot of companies now have a corporatewide imaging plan in

place or under development."

Indeed, when Smith began selling document imaging systems in the mid-1980s, the imaging marketplace amounted to a

handful of pioneering vendors and their equally pioneering customers. It was an exciting time, when vendor and user alike experimented, refined and as-

sembled the benefits of converting a paper document into an electronic representation stored on an optical disc.

No more. IDC/Avantech Technology, a market research and consulting firm in Framingham, Mass., said the imaging marketplace, although hampered by the recession last year, could double to \$1.9 billion by the end of 1992.

For pioneer Filenet, the surge in user awareness has brought with it competition — and lots of it.

Along with independent firms such as Filenet, the leading computer companies — sensing an immense opportunity — have one after another joining the fray.

Continued on page 110

Q4 earnings continue to map ups and downs of hard times

Fourth-quarter earnings reports posted by computer industry firms last week continued to reflect the now-familiar themes of doing business at the crossroads of an economic recession and a technological revolution:

- Restructuring costs hammered Ameritech Corp.'s fourth-quarter profit down 31% from the \$287 million net income logged in last year's comparable period.
- The first financial fruits of Computer Sciences Corp.'s \$3 billion debut in the commercial outsourcing arena boosted the firm's revenue, while the recons-

truction spread across Europe dragged its quarterly net income 3% below last year's fourth-quarter profit line.

In a fight at the end of the costly restructuring tunnel shone from Computer Associates International, Inc. Its cost-containment efforts behind it, analysts said, the software giant posted its strongest, single quarter yet. CA's surging revenue and profit, CA President Anthony Wang said, was delivered by strong sales across product lines and geographic boundaries.

In Stamford, Conn., IBM finance and leasing subsidiary

Fourth-quarter 1991 earnings*

| Company | Revenue Oct. to Dec. 1991 | Percent change from 1990 | Profit Oct. to Dec. 1991 | Percent change from 1990 |
|---|---------------------------|--------------------------|--------------------------|--------------------------|
| Ameritech Corp. | \$274B | 1% | \$16.2B | (37%) |
| AST Research, Inc. | \$239.1M | 4% | \$16.7M | 2% |
| IBM Software, Inc. | \$48.7B | 5% | \$33.2B | 12% |
| Computer Associates International, Inc. | \$455.1M | 1% | \$76.17M | 20% |
| Computer Sciences Corp. | \$544.6M | 2% | \$16.1M | (3%) |
| Legato Corp. | \$56.25M | 5% | \$12.04M | 24% |
| NELL Systemhouse, Inc. | \$184M | 4% | \$24 | (56%) |
| Software Publishing Corp. | \$41.11M | (4%) | 4.1M | (37%) |

*Figures indicate a reduction or loss.

CW Chart: Michael Higgins

IBM Credit Corp. (ICC) found the boisterous 1991 results that evaded its beleaguered parent: ICC posted annual net income of

\$200 million, up 21% over last year, on an asset portfolio increased 2% to \$11.3 billion.

NELL MARGOLIS

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all spending in the last seven days

COMPUTERWORLD

Filenet imaging stays ahead of the pack

CONTINUED FROM PAGE 109

Systems integrators and consultants, likewise, are in on the action, with whole practices devoted to imaging.

Part of the change, according to Smith, has been a growing receptivity to the value of imaging on the part of data processing departments that once failed to acknowledge there was a "paper problem" in their companies.

"We once went to the [information systems] vice president of a major credit-card company and he said there was no paper problem," Smith said.

"On the other hand, the departmental management saw the piles of paper and what their people were dealing with," he said. This disparity has been a constant in his customer profiles, said Smith. More often than not, it is the user department that sponsors an imaging project.

Compelling concept

What IS managers could understand, however, was Filenet's Workfile software, a set of software modules that automate the trafficking of text and images between people, applications and devices in an enterprise. Indeed, the concept has been so compelling that it has become a generic term: A number of imaging vendors now offer work-flow software.

Rich Edwards, a senior analyst at Robertson, Stephens & Co., a San Francisco investment bank and market research firm, said a number of imaging vendors missed the point that managing digitized images, storing them to disc and displaying them on a screen is only the lowest level of the technology. "On top of that, you need applications to apply to business problems," he said. This, he added, is where Filenet's Workfile fits in.

Bruce Silver, director of image management systems at BIS Strategic Decisions in Norwell, Mass., put it this way: "You have to give Filenet the credit for a) inventing the concept and b) having the best software to do it." Silver and others also credit Filenet for deciding, in January 1991, to offer Workfile under MS-DOS and Microsoft Corp.'s Windows, giving users the important option of using standard personal computers rather than Unix workstations.

An interesting question is whether Filenet could market Workfile independent of imaging. Most analysts think not — at least not now. First, several analysts said, while Smith's company has moved quickly in the direction of becoming a software vendor and away from its historic roots as a maker of proprietary hardware sys-

tems, hardware sales still account for 60% of its revenue (down from 95% in the first quarter of 1990). Second, a client/server work-flow product would require distribution and marketing muscle that Filenet does not have.

A final impediment is that Filenet "is

actually lagging in the area of graphical tools for end users," Silver said. "For them to get into [the mass-market work-flow arena] they'd need an end-user tool set to complement what they have on the server." No firm has yet "locked up" the mass-market work-flow market, he said.

And the winner is?

The market for high-end imaging systems — those priced at more than \$500,000 — is dominated by Filenet, IBM and Wang Laboratories, Inc.

• Filenet is believed to have installed the largest number of systems — more than 460 — but is behind IBM in terms of revenue. It was both the 1990 and 1991 Association for Information and Image Management/Datapro customer satisfaction surveys.

• IBM does not break out imaging as an independent product category; however, it is widely believed to have passed the \$1 billion sales mark in 1991.

• Wang is a pioneer among the company's competitors in the area of document imaging. However, its well-documented financial woes have reduced its competitive threat, according to analysts.

Moreover, analysts expect to see disruptions as Wang migrates its hardware base to IBM platforms; the firm's current imaging customers use the Wang VS minicomputer.

All three companies have products geared toward "production" applications, such as the processing of insurance claims or accounts-payable in-

voices. Filenet Chief Executive Officer Ted Smith acknowledged the role of imaging for office automation and what he called "personal business support" tools; however, he said he believes the technology's major growth will be in the production-oriented area, where the economic benefits are easier to justify to management.

What of IBM? Bruce Silver, BIS Strategic Decisions' director of image management systems, said IBM will be a more prominent imaging vendor as the Fortune 500 looks to add imaging to overall IS plans. This could be worrisome to Filenet. "As time goes on," Silver said, "they're going to find themselves [marketing] to end users when procurement decisions will be made higher up."

Smith acknowledged that computer vendors in general, and IBM in particular, will be "the principal players, along with a few independents like Filenet," in the imaging marketplace. In view of the huge market projected overall, he said, the prospect of IBM seizing a sizable part "doesn't keep me up at night."

ELLIS BOOKER

INTERNATIONAL BRIEFS

Promising news

► The People's Republic of China, one of the most flagrant violators of U.S. software copyright law, signed an agreement pledging to protect software as literary works. In a memorandum of understanding, China said it will formally join the Berne Copyright Convention — effective Oct. 15, 1992 — and will protect U.S. copyrighted works within 60 days. The U.S. had threatened China with trade sanctions under Section 301 provisions of U.S. trade law if it did not act to curb software piracy.

Open society

► Highly placed backers in government and industry have joined forces to create a society for open systems, Stowarzyszenie Systemów Otwartych, in Poland, according to a recent report in the Polish business press. The founding committee, according to the report, includes among others the information technology director at Poland's Council of Ministers.

Better days

► Siemens-Nixdorf Informationssysteme AG said group sales in the first quarter of its 1991-1992 fiscal year rose

21% to \$1.6 billion, according to a recent report in the French financial press. The company also said new orders for the first quarter — October through December — rose 20% to \$1.7 billion. No year-to-year comparisons were supplied, according to the report, since Siemens-Nixdorf does not usually report its quarterly earnings.

Being there

► Picturetel Corp., a player in the growing market for video compression-based visual telecommunications, will soon be selling and servicing its dial-up video deconferencing systems through its own subsidiary in Japan. Capitalized at approximately \$78 million, the recently created Picturetel Japan K.K. will work in concert with its Peabody, Mass.-based parent company's current Japanese representative, Kyocera Corp.

Manila chips

► Integrated chip design in The Philippines is in a boost this year as local semiconductor assembler Integrated Microelectronics, Inc. (IMI) gears up for a joint venture with Hong Kong- and U.S.-based partner IMI, a subsidiary of real estate conglomerate Ayala Corp., in negotiations with Valencia Semiconductor, Hong Kong, Ltd. and Milpitas, Calif.-based LSI Logic Corp.; company officials told Computerworld Philippines last week.



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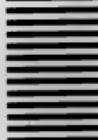
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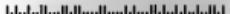
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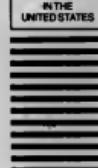
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For start-up, \$2 million is Serius money

BY JIM NASH
CW STAFF

SALT LAKE CITY — Like the saline waters of the Great Salt Lake edging ever nearer to this mountain city, interest in object-oriented software continues to rise slowly, almost unnoticeably — but steadily, nonetheless. Earlier this month, evidence of object technology's rising tide surfaced when tiny Serius Corp. announced that it had received \$2 million in equity capital from an investor group led by networking giant Novell, Inc. A 3-year-old privately held company, Serius makes a library of software objects that substitute for hundreds of lines of code within larger programs that run on Apple Computer, Inc. Macintosh computers.

Novell ponied up \$700,000, according to a Serius spokeswoman. The rest of the \$2 million came from Los Altos, Calif.-based venture capitalist Crosspoint Venture Partners and Intermetrics, Inc., a Boston developer of defense-related Unix software. By computer industry standards, \$2 million is minuscule. But it is twice the amount analysts estimate Serius made in product sales last year.

"Serius is raising software development away from code," said Joe Firrage, Serius' founder and chief executive officer. By enabling programmers to more easily create their own software, Firrage said he hopes to "free career software staff from repetition." Today, the company markets Serius Programmer 3.0 and Serius Developer 3.0.

Together, the two products offer 48 objects and 350 programming functions. The objects vary from window-building and animation routines to entire generic databases and spreadsheets. They also enable users to define objects of their own. A Microsoft Corp. Windows version is under development, Firrage said.

"We don't know of anyone else doing what Serius is doing," said Bob Hoff, general partner at Crosspoint. Hoff said object-oriented technology is evolving into commercially viable goods that will eventually move from programmers' workstations out to end users' desktops.

Destiny calls

Object-oriented software is destined to play a larger role both in how Novell builds its own software products and in the operation of the products themselves. The firm has said object orientation will become an intricate part of future Novell products. With Novell's money came an agreement that Serius would make objects compatible with Novell's Netware network operating system.

Part of Serius' long-range plans is to make all of its objects operating system-independent. Each object will inherently have the code to graft itself onto many or all major operating systems, Firrage said. DOS-based Netware is eventually expected to run on any operating system, Novell executives said. Firrage said Serius has been enlisted in that effort.

As for Intermetrics' appetite for investing in Serius, Firrage acknowledged initial surprise. "The defense contractor also invested \$1 million a year ago. That was interesting to us," he said. Firrage said he has since learned that "Intermetrics has been looking to get out of government contracts, and object-oriented

programming is one alternative."

Charlotte Walker, an analyst at Martin Simpson & Co., said she sees object-oriented software and expert systems technology as descendants of the artificial intelligence movement. It is the next step in automating the construction of programs as well as the operation of computers, Walker said.

Simply stated, objects are merely codestractions. Developers, for example, can drag an icon — which represents all the code to send a document to a printer — into the proper place within their networking code, saving them the need to

recreate software for every product.

That notion is not new. Rudimentary modular programming was born about



the same time as 21-year-old Firrage, said John DeArmon, an analyst at Dataquest, Inc. Until recently, the price/performance ratios of hardware made object

technology commercially impractical. Now, with affordable workstations bargaining with computing muscle, he said, Serius stands at the edge of a \$350 million to \$400 million market that he expects to grow at a minimum rate of 35% annually for the next five years.

Much of that market consists of independent developers whose options are limited to using shrink-wrapped software or writing their own scratch.

Peter Kastner, vice president at Aberdeen Group in Boston, said those opting for building their own can choose from packages such as Borland International, Inc.'s Objectvision.

"But Objectvision comes with 25 pounds of documentation," Kastner said. Serius, he said, is far less daunting.



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Playing games can be all in a day's work

BY ALICE LAPLANTE
SPECIAL TO CW

If James Wood is caught playing a computer game during office hours, his boss is more likely to give him a pat on the back than a raise.

Wood is computer systems supervisor at Lucasfilm Games, a division of San Rafael, Calif.-based Lucasarts Entertainment Co., which produces both movies and computer games. It's part of Wood's job to be familiar with his company's game products, which include such titles as *The Secret Weapons of the Luftwaffe* and *Indiana Jones and the Fate of Atlantis*.

Wood doesn't actually work on the games. His job is to support the division's personal computers and Apple Computer, Inc. Macintoshes. Still, familiarity with the end product is important, he says, "because I keep track of how systems problems will affect development projects, and I need to know how to prioritize any problems that arise."

At some companies, the connection is even more direct, and information systems employees are regularly drafted for product testing. When it gets close to product release time at Maxon, a computer games company in Orinda, Calif., that makes the highly popular *SimCity*, a simulation game that allows users to

plan entire communities, "everyone in the company stops what they're doing and starts playing games," says Tony Rumpf, MIS manager.

Better than work

It sounds like more fun than working in a traditional IS department. Wood and other IS managers at computer game software companies say, "It is!" and prove the point by taking salaries that are usually lower than average for their positions. Wood, for example, estimates that he could probably be earning \$10,000 more working in the IS department at a bank.

Indeed, almost all of them say they could make more money working for Fortune 1,000 firms, but they prefer the more casual and creative atmosphere of the games industry. Darryl Peck, president of Inline Design in Sharon, Conn., a \$1 million marketer of computer games such as *Darwin's Dilemma*, freely admits he can't compete with the salaries at more traditional IS jobs. "But that kind of person probably wouldn't be interested in working here anyway," he says.

In fact, those interested in expanding their technical skills would probably not find most jobs in this business appealing. There are some exceptions. Rumpf, for example, says that his company is very technology-conscious and believes in obtaining the latest

software, systems and networks.

For the most part, however, games companies are equipped like small, growing businesses everywhere. Few have any systems larger than PCs, which are used in everything from games development to routine business applications. IS responsibilities usually cover negotiating for the most favorable hardware and software prices,

adaptable and willing to pitch in wherever they are needed.

"I look for people with a lot of energy, who have a very service-oriented approach and don't perceive their job as sitting in front of a terminal and punching keys," says Don Hughes, IS director at Software Toolworks, Inc. in Novato, Calif. "It's very much a roll-up-your-sleeves-and-

answering user questions and keeping the machines functioning."

Most game companies have very small IS departments, if, in fact, such a distinction exists at all. Sometimes systems responsibilities are simply shared by all employees. Even when a more formal structure does exist, IS staffers are expected to be flexible,

adaptable and willing to pitch in wherever they are needed.

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ing the machines functioning."

Sometimes the

rolled sleeves are very literal.

"If there are any walls or desks that need to be moved, these are the folks who do that," says John Steel, a producer at Accolade, Inc., an 80-employee games company in San Jose, Calif.

If IS professionals in this industry are sometimes asked to handle low-level jobs, they are also frequently given opportunities to stretch upward.

At Greatwave Software, Inc. in Scotts Valley, Calif., for example, programmers customarily do more than just program. "One programmer is in charge of the customer database; another is in charge of financial accounting functions," says Chad Mitchell, chief technical officer at the firm.

At Acclaim Entertainment, Inc. in Oyster Bay, N.Y., John Ma, vice president of planning and operations, is currently looking for an IS professional to work with the company's sales group on automation of key accounting processes. One requirement, Ma says, is that "he or she will need to function as a full member of the management team."

Into development

Occasionally, IS staffers even go beyond playing games and move into development.

But, according to Peter Brown, director of technical services at Electronic Arts in San Mateo, Calif., that's more the exception than the rule because the personalities that are drawn to the two kinds of jobs tend to be quite different. Developers wear blue jeans and long hair, he says. IS people may wear blue jeans, but their hair is usually short, and sometimes they even add a tie.

The way Brown sees it, "This kind of career track is for the IS professional looking for a little bit of a change, who could fit into a standard IS division, but wants a more relaxed atmosphere."

LaPlante is a free-lance writer based in Palo Alto, Calif.



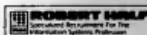
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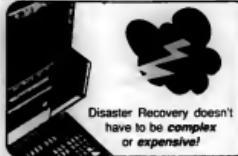


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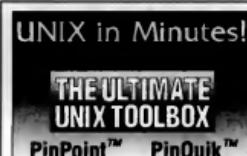


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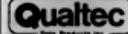
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MARKETPLACE

Licensing can mean hassles, the box-top variety included

Legal eye is a column exploring legal issues and their impact on information systems.

BY MARC S. FRIEDMAN
AND LYNN PUCHALSKI
SPECIAL TO CPW

Hold on — don't throw that box away! If you do, and the new software you are so anxious to try out is the box-top variety, you may be left without a clue about your rights. In fact, any time you buy software, it is best to read the fine print on or in the container first.

Box-top licensing, also known as shrink-wrap licensing, is one of two common ways to license software. It applies when the software is mass-marketed and the software vendor cannot negotiate each license agreement. The other method is a signed software license stating the vendor's terms and conditions.

A box-top licensee may be found as a package insert in the box or printed right on the outside of the box. Either way, the text contains legal terminology that may limit product warranty

and the user's right to sue for damages.

Vendors ensure that the box-top license is binding by stating on the box that by using the software, the user agrees to the terms of the license. If he does not agree to the terms, the user has the option to return the software within a few days of purchase to receive a full refund.

Often, the risk posed by the legal terminology in a box-top license surpasses the cost of the software itself. A company might spend only a few hundred dollars for a software package to keep track of its accounts receivable, but if the product does not perform as promised, it cannot earn the company more revenue from its accounts receivable, causing problems that may exceed the software's wholesale cost. Disclaimers printed on the box may state that the vendor is not liable for such damages.

However, this type of dis-

claimer may or may not hold true. The question is whether the box-top license is an enforceable contract between the company and the vendor. It may be argued that there was no actual contract because the box-top license was not brought to anyone's attention until after the transaction was finalized.

For example, a New Jersey court held that the provisions of a contract found in the glove compartment of a new automobile after delivery to the buyer were not enforceable if they did not interfere with the car owner's right to sue.

A software vendor, however, could argue that fairness and justice dictate that the box-top license be enforced as a contract between it and its customers. They may say the package clearly draws attention to the fact that license provisions are printed on it or on a package insert.

Moreover, the vendor usually gives the customer a few days to

return the product if he is dissatisfied. Finally, the vendors argue, the software makers cannot be expected to negotiate every license agreement for software selling for only a few hundred dollars.

In response to vendors' successful lobbying, state legislatures in Louisiana and Illinois passed statutes stating that a box-top license would be enforceable if the package stated that a box-top license was inside, and it provided an out to a dissatisfied user. Both, however, have since been repealed.

Recently, a federal court in Philadelphia decided on a case that raised the issue of the enforceability of box-top licenses. In *Step-Saver Data Systems, Inc. v. Wav Technology, Inc.*, the court found that the box-top license did not create a contract. Instead, it was simply a written confirmation of an oral agreement between the vendor and user that contained additional terms not discussed by the parties involved. By looking at the box-top license in this light, however, the court did not have to decide whether box-top licenses are generally enforceable.

Because it is impossible to predict whether a box-top license will be enforced in a particular case, a software purchaser must always be on guard. If the soft-

ware can be purchased directly from the vendor, users should insist on a written license agreement instead of the box-top license when possible, and they

OFTEN, THE RISK posed by the legal terminology in a box-top license surpasses the cost of the software itself.

should also insist on the following conditions:

- All parts of the agreement must be in writing.
- The writing must be signed by the vendor and user.
- The user must receive and retain a copy of the fully executed agreement.

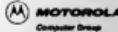
Direct bargaining with a vendor is often not a possibility because the software is mass-marketed or purchased over the counter. A user should carefully review the license before the software is used. If the software is defective, the vendor should be notified immediately and the software returned in accordance with the terms of the license.

Friedman leads the high-technology group at Friedman Segalman in Roseland, N.J. Puchalski, an attorney at Friedman Segalman, specializes in computer and technology litigation.

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RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: Sun Microsystems, Inc. (Bear, Stearns & Co.). Although Sun shares are still a good buy, Hewlett-Packard Co.'s new low-end workstation could cause downward pressure on Sun stock. Take advantage of this opportunity. Sun workstations, such as the Sparcstation 3 line, which is likely to be announced this summer, may eclipse HP's new systems.

DOWNGRADED FROM MODERATELY ATTRACTIVE TO NEUTRAL: Borland International, Inc. (Donaldson, Lufkin & Jenrette Securities Corp.). Borland saw little growth for the quarter just ended. An in-house study suggests that Dbase users are either waiting for the company's upcoming new products or considering alternatives, such as FoxPro. Although Borland has good technology, there is a high risk that its new products will be delayed or simply start out more slowly than anticipated.

UPGRADED FROM UNDERPERFORMER TO NEUTRAL: Compaq Computer Corp. (Alex, Brown & Sons, Inc.). Last quarter finished somewhat better than expected for a number of desktop computer companies, including Compaq. This will likely be reflected in its earnings report due tomorrow. Strong sales for new products, spurred by the company's lower prices, drove the good financials. Also, better-than-expected currency swings abroad and continuing efforts at expense control paid off.

UPGRADED FROM NEUTRAL TO MODERATELY ATTRACTIVE: Micrografx, Inc. (Donaldson, Lufkin & Jenrette). Business appears to be picking up. The company has focused on low-end drawing and high-end technical illustration sectors of the Microsoft Corp. Windows graphics market, thus sidestepping the intense competition from Microsoft, Lotus Development Corp. and Software Publishing Corp. in the mainstream presentation segment. International sales are strong, too.

MORE 1992 PICKS

Computer Software and Services

Lowell Giltz, Bear, Stearns, Jan. 16.

Looking forward, a few old trends and some emerging ones will color the 1992 horizon.

Networking remains the top priority for large computer installations. Novell, Inc. continues to be rated buy because of its leadership slot in that sector and its expansion into general operating systems.

Unix will gain much strength now that hardware independence is a reality. However, hardware will not make Unix a true industry standard — only software can. Therefore, companies that sell tools for easing the software development process — especially those that use object-oriented technology — will have an edge. Borland.

Three factors in a company make its stock worth buying: superior technology, visionary and cost-conscious management and solid marketing.

Two service companies did surprisingly well in the second half of 1991 after lackluster first halves. Revenue at Policy Management Systems Corp. was up 60% for the year compared with 1990. Sungard Data Systems, Inc. racked up a 68% sales gain in 1991 over the year before. They are rated neutral now, but look for more user outsourcing this year.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

• Last week's big losers included Data General Corp. (see story page 6), which plummeted 5% points — more than 30% — to close Thursday at 124. DG's first-quarter profits were weaker than expected.

• Quarterly earnings influenced stock movement elsewhere. Borland International, Inc. reported higher income but lower sales for its fiscal third-quarter 1992, compared with the same period last year. Borland shares sank 3% points last week to 71%. Quarterly profits at Unisys Corp. went up, as did its stock, which gained 1% points to 7 (see story page 6).

• Among other gainers, Network General Corp. surged 2% points, closing Thursday at 22%. Advanced Micro Devices, Inc. jumped 2% to 20%.

• After introducing five new Unix workstations last week, IBM stumbled 1% points to 934. Meanwhile, Sun Microsystems, Inc. picked up 1% points to 344, and Hewlett-Packard Co. lost 2 points to 60%.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JANUARY 24, 1992

| TOP PERCENT GAINERS | TOP PERCENT LOSERS | Jan 20 | Wk Chg | Mo Chg | Yr-to-Date Chg |
|---------------------------------|---------------------------|-----------|---------|--------|---------------------------|
| Unisys Corp. 8.60 | Data General Corp. -16.18 | GTC 16.10 | 5.38 | -0.00 | AGC Computer Sys. 16.12 |
| Ariel Communications Corp. 8.50 | Comshare Inc. -16.00 | GTC 16.05 | 5.25 | -0.00 | Autodesk Inc. 16.12 |
| Micrografx Inc. 8.40 | Intergraph Corp. -15.95 | GTC 16.00 | 5.20 | -0.00 | BDSI Systems Inc. 16.12 |
| Wingsoft Inc. 8.4 | Intertech Corp. -15.75 | GTC 15.95 | 5.15 | -0.00 | Borland Int'l. 16.12 |
| Ultimate Corp. 21.05 | Convergent Inc. -15.75 | GTC 15.90 | 5.10 | -0.00 | Braswell Corp. 16.12 |
| | | GTC 15.85 | 5.05 | -0.00 | Cognex Corp. 16.12 |
| | | GTC 15.75 | 5.00 | -0.00 | Computer Horizons 16.08 |
| | | GTC 15.70 | 4.95 | -0.00 | Computer Team Group 16.05 |
| | | GTC 15.65 | 4.90 | -0.00 | ComputerUSA 16.05 |
| | | GTC 15.60 | 4.85 | -0.00 | Corporate Software 16.05 |
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| | | GTC 0.50 | -1.25 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.45 | -1.30 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.40 | -1.35 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.35 | -1.40 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.30 | -1.45 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.25 | -1.50 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.20 | -1.55 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.15 | -1.60 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.10 | -1.65 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.05 | -1.70 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC 0.00 | -1.75 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.05 | -1.80 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.10 | -1.85 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.15 | -1.90 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.20 | -1.95 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.25 | -2.00 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.30 | -2.05 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.35 | -2.10 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.40 | -2.15 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.45 | -2.20 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.50 | -2.25 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.55 | -2.30 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.60 | -2.35 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.65 | -2.40 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.70 | -2.45 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.75 | -2.50 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.80 | -2.55 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.85 | -2.60 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.90 | -2.65 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.95 | -2.70 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.10 | -2.75 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.15 | -2.80 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.20 | -2.85 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.25 | -2.90 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.30 | -2.95 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.35 | -3.00 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.40 | -3.05 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.45 | -3.10 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.50 | -3.15 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.55 | -3.20 | -0.00 | Corporation Int'l. 16.05 |
| | | GTC -0.60 | -3.25</ | | |

Systems integration strategy

CONTINUED FROM PAGE 1

a good area," he said.

A newly PC-aggressive DEC said it can change the past. (Remember, DEC is bound to put off grid until the proprietary Rainbow PC.) The company said it will become a contender via a mix of competitive pricing, industry-standard PCs, sophisticated open architecture networking and support services.

DEC is attacking the PC market from the perspective of a systems integrator, said William Johnson, corporate vice president of marketing. DEC is offering multivendor integration capabilities via its Network Applications' Support (NAS) products and bolstering these offerings with a worldwide service organization. NAS products and services may be the only compelling piece of value-added DEC has to offer users already standardized on other brands, observers contend.

DEC's PC strategy could be viewed as a Trojan horse designed to boost sales of its traditional products and services. Aaron Goldberg, a technology analyst at International Data Corp., comments that if DEC can somehow raise the level of PCs in the installed base, it will have a multibillion-dollar business. And while this might not offset the slower mainframe and midrange sales, Goldberg hypothesized, for every 100 PCs sold, DEC will also sell a VAX system to function as a server.

Significant opportunity

John T. Rose, vice president at DEC's Personal Computing Systems Group, said he agrees there is significant market opportunity beyond the initial PC sale. He noted that DEC will be able to offer customized open systems integration and full service and support capabilities for any variety of DEC and competitor's equipment.

"A key component in DEC's strategy is Pathworks, which links different architectures. A pact with Microsoft Corp. last fall resulted in Windows support

under Pathworks.

"By riding on the coattails of Windows, DEC will emerge as the primary vendor of distributed systems software and proliferate its wide-area network products," said UBS Securities Inc. analyst Marc G. Schulman in a report on DEC.

Pathworks also supports DOS, IBM OS/2 and Apple Computer, Inc. Macintosh environments — an integration scenario commodity PC suppliers just cannot deliver, Rose said.

In its latest stab at cracking the PC market, DEC initially positioned itself as a price leader, entering the market late last spring with a handful of aggressively priced Intel 80386- and 486-based PCs with entry-level boxes starting at under \$6,000. Since then, its pricing edge has dissipated, users and analysts said.

The DEC PC433, an Intel 486-based, 33-MHz machine, currently carries a price tag of \$6,699, which most analysts agree is still undercut by pricing offered by other close makers. Despite DEC's discounted mail-order campaign (see story below), its PCs still seem to be "a couple of hundred dollars over" prices charged by several other mail-order companies, said John Bruckaske, director of information systems at Protein Technologies, Inc.

Looyal users

If some users are disappointed with DEC's pricing, others — such as London Life Insurance Co. in London, Ontario, and the Cleveland Board of Education in Ohio — swear by DEC's integration techniques.

Tom Cagle, Cleveland's director of student IS, has more than 100 Intel-based PCs and Macintoshes linked across the school system via Pathworks to a hub of Vaxusters at the central office. Cagle and DEC's size, expertise and support were critical in getting 1,500 users and several architectures to function as

ROSE SEEDS PC SUCCESS



According to software vendor provider Perseus Development Group, the company's success in the PC market requires the following:

- Support for all PC-standard network protocols and platforms via the DEC Pathworks and Templus products.

- Continued relationships with Microsoft, Apple, Novell, Tandy and Olivetti, as well as upcoming partnerships with other parties both in the U.S. and international markets.

- Continuing with DEC's strategy of remarketing PCs at competitive street pricing.

- Offering comprehensive worldwide integration and support services for multivendor desktop environments.

one network.

Richard L. Kroke, manager of technology architecture at London Life, was an early customer of DEC's desktop integration offering, starting back in 1987 with the predecessor to Pathworks. He said standardizing on

a single vendor makes life easier on a network. "Our experience with that technology taught us that there can be subtle differences in memory architecture, configuration files and other areas which equals complications," Kroke said.

However, the loyalty of DEC's user base is unclear. "I don't see that DEC has any particular competitive edge just because we are DEC customers," said Raymond V. Sasso, chief information officer at J. R. Simplot Co., a food processor for the fast-food industry.

The company must also prove itself to non-DEC shops, a rougher sale given the vendor's prior disastrous foray into the PC market and the timing of its current entry into a market that is nearing saturation.

Mark E. Horak, manager of litigation support at the international law firm of Fulbright & Jaworski, is currently using Novell, Inc.'s Netware to link 850 Compaq Computer Corp. PCs in the Houston area.

"Our decision was made last year, and we didn't consider DEC to be said."

Still, DEC could have an edge among customers who are looking for one-stop shopping and no finger-pointing, Goldberg said.

"The relationships are there — DEC just has to exploit them."

The customers are through the mail

DEC is aggressively pursuing mail-order sales, along with several other distribution channels, in hopes of snaring sales in desktop hardware, software and services.

Desktop Direct, a catalog mail-order campaign, was formally launched last week. Now customers can catalog-order DEC's Intel-based PCs at prices 50% lower than previously available.

DEC has waffled on just how aggressively it will cut its PC prices, most recently stating it does not aspire to be the PC price leader. Instead, it plans to stay well within the 20% street price variance to remain competitive in hardware sales.

Raymond V. Sasso, chief information officer at J. R. Simplot Co. in Boise, Idaho, said he finds Desktop Direct "kind of interesting," but he questioned DEC's entry into an already mature market with thin profit margins.

"Sure, they have reduced their PC prices to reasonable levels, but they are not outstripping the competition by any means," observed Robert Cleinger, a six-year DEC customer and data

processing manager at OK Industries, Inc. in Fort Smith, Ark.

Cleinger would only buy DEC PCs if the DOS support matches that for VMS, he said.

A DEC spokesman said the company will offer the support usually found at the mainframe level, drawing on the expertise of more than 20,000 employees dedicated to field service, support, training and consultation — a claim no other mail-order distributor can make. DEC is primarily targeting accounts where systems integration and adequate support are often issues.

Analysts remain skeptical, however. David B. Evansch, director of research at Workgroup Technologies, Inc. in Hampton, N.H., said, "Mail order attracts buyers with some level of PC expertise. Armed with this knowledge, they shop price."

DEC is not content to rest its channel distribution strategy on Desktop Direct. The company is also pursuing OEM, value-added reseller and specialty distributors, as well as piloting a program to establish a systems integration channel.

SALLY CUSACK

Despite DEC founder Kenneth Olsen's oft-quoted questioning of who would want a computer on their desktop, DEC has made numerous attempts to break into the market.

MAY 1982
► Professional 325 and 350, Rainbow 100 and DEC Mate II introduced

SEPT. 1986
► Vaxmate, a networked PC running VMS and MS-DOS, introduced

JAN. 1988
► Joint development deal launched with Apple to link Macintoshes and the Appletalk network with VAX systems and Decnet/OSI networks

SEPT. 1988
► DEC buys share in Mips Computer Systems

OCT. 1990
► DEC 433 MP System, based on SCO Unix V and the Intel 486 processor, introduced

APRIL 1991
► DEC joins with Compaq and Microsoft to forge RISC-based desktop standard

MAY 1991
► Broadcast set of DEC PCs unveiled, all optimized for networked computing. Includes 80386-based DECpc 333 portable and DECpc 320SX notebook, 486-based DECpc 433 and DECpc 433T PCs

NOV. 1991
► DEC and Microsoft announce an alliance allowing Microsoft's Windows to retrieve and exchange data with DEC's Pathworks LAN software

Developer's exit could further slow Repository

CONTINUED FROM PAGE 1

ect to fruition said they remain committed to making it work. However, observers said Ulbricht's resignation sends out a strong signal that all is not well.

"It's significant when a key manager decides to leave at a critical point in the product's life," said Paul Hessinger, chief technology officer at SoftLab Inc. in Atlanta. "He's done some very good work, and it will be a loss."

One user who is close to the Repository project and knows Ulbricht agreed that IBM has "lost a valuable asset" and a "star technician. But one person does

has "cried Repository too often. I can only sell this to my senior management so many times. I have to be darn sure it works before I will try to sell it again."

Other users echoed Morrow's wait-and-see approach. "At one point, we were looking to use it, but we're not waiting with baited breath," said Michael Slatenberg, vice president of technical services at Manu-facturers Hanover Corp. in New York.

Still other observers questioned whether Repository will ever truly be ready for prime time. Among the technical issues are the following:

- Performance may not be quick up to snuff.
- The underlying meta-data model is inadequate," said Michael West, program director at Gartner Corp. in Stamford, Conn. "It has to generate thousands of tables, and it becomes impossible from a performance perspective."

- The lack of immediate support for a client/server architecture, which has rapidly gained a foothold since IBM announced Repository in September 1989.

- The lack of Repository support from some of IBM's own CASE tools, including Cross System Product.

Complicating matters, some analysts alleged, is the lack of commitment from the third-party vendor community. "If the market is lukewarm, would you spend money pumping up Repository Manager, or would you concentrate on your existing product and customer set?" asked Vaughan Merlin, a partner at Boston-based Ernst & Young.

Strong commitment

IBM and AD/Cycle business partners "exceeded our expectations," he said. "We're working as fast as we can," said Michael Ryan, senior vice president at KnowledgeWerks.

"Our commitment remains strong. It's not an easy undertaking."

Jon Hemming, manager of product strategy in IBM's Programming Systems line of business, concurred. "I don't blame people for being skeptical, but I don't feel the fact that customers are disenchanted or are moving away from it," he said.

IBM plans to address the issue of a client/server Repository Manager with an OS/2 version that will not require a mainframe to operate, in addition to a local-area network version, he said.

Borland, Microsoft to take on Lotus

CONTINUED FROM PAGE 1

E. Segrana & Sons, Inc. in New York. "It's always nice to have more than one choice."

Industry analysts said it is doubtful that either company could greatly damage Lotus' position.

"Lotus has an advantage because it's been in live, working situations," said Frank Deuback, president of Communications Network Architects, Inc. in Washington, D.C.

Microsoft is planning a product rollout based around a "messaging infrastructure," starting with Mail 3.0, which is scheduled for delivery in the second quarter. This will be followed by component software that will provide individual work-group functions, such as scheduling.

Development kit on tap
IBM also plans to promote its Messaging Application Programming Interface so developers can tailor applications to its infrastructure. A development kit is planned for shipment early this summer, said Laura Jennings, group product manager for work-group applications.

Borland, which is not ready to provide product information, claims that it will work to enhance existing applications for a group environment instead of delivering new groupware applications.

"The approach we plan is very different from Notes," said Ken Einstein, director of applications strategy at Borland. "It's

based on opening up capabilities [of] existing platforms, rather than forcing [customers] to adopt a different type of product." Lotus' strategy has been to offer Notes as a comprehensive environment, complete with work-group functions, document

the Microsoft and Borland plans. "So far, I don't see anything. It's easy to take potshots, but Lotus is the [only] one on the market you can buy."

David Marshak, a senior consultant at Patricia Seybold's Office Computing Group in Boston, said he expects each of the three companies to play up their individual strengths.

"I don't see them jumping in with the same kind of tools" as Lotus, Marshak said. "Notes does well at sharing and tracking. They have to position their products in a different space."

For example, he said he sees Microsoft focusing on work-flow functions and "the mail-enabled piece of it." Borland, Marshak said, "sees itself as [the provider of] data access." The company could be in a good position because work-group computing is about getting information to users.

Lots executives shrugged off the Microsoft and Borland plans and said the claim that Notes is proprietary is just hot air. "They don't have anything to sell," said John Landry, a senior vice president and chief technology officer at Lotus. "It's really easy to talk about things that you don't have."

Massachusetts Blue Cross/Blue Shield ails, tries EDS

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Chief Information Officer is being created and will be shared by Blue Cross' current vice president of operations, Bob Carroll, and EDS senior account executive Peter Carroll. Some 100 Blue Cross employees will report to Hollinger; the remaining 580 or so — EDS employees as of press time last week — will report to Carroll.

At the board level, Carroll and Hollinger will act jointly as "the CIO," he said.

While such a split could potentially strain the already divided loyalties inherent in an outsourcing contract, EDS and Blue Cross may be better positioned than most to make it work. "An organization the size of Mass. Blue Cross/Blue Shield can expect to wield a great deal of clout with EDS," noted Philip Lohman, director of research for First Consulting Group in Long Beach, Calif.

At the end of a 60-day evaluation, "some changes are expected

management and development tools. This approach has won it some dedicated accounts that praise Notes and do not seem at all interested in what competitors have to say.

"Talk is cheap," said Sheldon Laube, national director of information and technology at Price Waterhouse, when asked about

back away from the project about 18 months ago, estimated \$60 million had been invested into the hapless system, the last surviving element of which was still being put to work.

The outsourcing alternative, formerly considered and rejected by Blue Cross as too costly, reemerged this past fall, spearheaded by Joyce and Blue Cross Senior Vice President and Controller Joe Firmano.

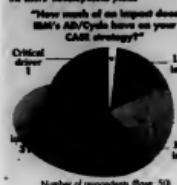
Surprisingly, EDS' Lotz noted, health care has been relatively slow to prescribe technological cures for its notorious bureaucratic nightmares.

"Throughout the banking industry, you see extensive use of electronics in all sorts of communications and transfers," Lotz said. "In health care, by and large, it's still, 'Slap on a 25-cent stamp and walk it down to the mailbox.' "

That isn't how it is about to be at Blue Cross, Joyce said. First up under the new contract is a joint development project to "create a new definition of voice and data architecture, primarily to improve our customer service," he explained. First fruits of this effort should ripen by mid-spring, he added.

Deaf ears

IBM's AD/Cycle is having little impact on users' development plans



Source: Foresight Research, Inc. CW Chart: Michael Neff

not a project make."

The user said he is more concerned about the technical issues dogging Repository, most notably the lack of ability to manage several versions of an application, also called "versioning."

"I'm frustrated with IBM for not delivering versioning sooner but also with the third-party vendors for not delivering their products sooner," he said. "People bash IBM with some justification, but it's not all IBM's fault. The business partners haven't cooperated. They've been talking about it since 1989, but talk is cheap."

To date, only the financially troubled KnowledgeWerks, Inc. has a software package that keys to Repository Manager, although an Intersolv, Inc. product is due out in March.

"There are too many" companies developing Repository, said Jim Morow, vice president of technical planning of Shearson Lehman Brothers in New York. "IBM has to lead and not just follow the pack."

Sherman, along with other business units of American Express Co., tested Repository Manager for about two years before returning the tapes to IBM. "We did not reject Repository; we just postponed it. We will look at it again when it's ready," Morow said.

Still, he cautioned that IBM

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JANUARY 27, 1992

IBM stations seek high ground

BY MARYFRAN JOHNSON
CWT STAFF

SAN FRANCISCO — IBM bounded back to the front lines of the Unix workstation wars last week with five new models of the RISC/System/6000 line, a more user-friendly release of the AIX operating system and expanded Unix networking options, including Novell, Inc.'s Netware 3.1.1 for AIX/6000.

The announcement also provided a sneak preview of new workstations to come. The new low-end Model 220 employs IBM's first single-chip reduced instruction set computing (RISC) processor — to be used in the so-called Personal personal computers coming in early 1993 from the partnership of IBM, Apple Computer, Inc., and Motorola, Inc.

This RISC processor will run a lighter version of AIX that contains a subset of functions needed for desktop use, said Donna Van Fleet, director of IBM's Personal Systems Pro-

gramming Center in Austin, Texas.

Dave Card, an analyst at International Data Corp. in Mountain View, Calif., said that with the expandable RS/6000 Model 220 color version, IBM is moving the "sweet spot" in the market for color workstations down from the \$12,000 to \$15,000 range to less than \$10,000.

Only Sun Microsystems, Inc. offers a color workstation for less than \$10,000 — the Sun IPX — but that is 2-year-old technology with lower performance ratings than IBM's new machine.

Also, the availability next month of Netware for AIX (priced from \$5,500 to \$25,000) will allow PCs on a local area network to access an RS/6000 server.

Wausau Insurance Co., in Wausau, Wis., is considering bypassing IBM's LAN Manager and using Netware instead. However, Bob Denison, Wausau's open systems development manager, needs to know whether

Novell will pledge to support the Open Software Foundation's Distributed Computing Environment (DCE) technology. "We want Netware to play in DCE."

A second network option, the

6000s. That could be too long a wait for some customers.

Wausau Insurance, for example, is mated out on its RS/6000 Model 550 and needs more power than the 560 offers.

"We're looking at multiprocessing environments from other vendors now," Denison said. "That's the big advantage for

client memory to actually run applications, IBM configured all three versions of the Model 220 with 16MB bytes of base memory and added integrated Ethernet, small computer systems interface capabilities and a special graphics adapter.

The high-end Model 560 gives IBM a 15% to 20% advantage in cost per transaction over rival Hewlett-Packard Co.'s Series 800 minisuper Unix systems, according to IBM.

With its \$60,000 to \$100,000 price range, the Model 560 falls into traditional high-end workstation brackets but is actually as powerful as a superminicomputer. It has an 89-Specmark rating and a clockspeed of 50 MHz and offers 30.5 million floating-point operations per second.

IBM is placing greater emphasis now on making AIX easier to install, maintain and use, according to Van Fleet.

To increase the RS/6000's allure to commercial mainframe customers, IBM's networking division is preparing to ship an early version this year of a key transaction processing monitor.

REPORTER'S NOTEBOOK

Unix systems vendors may be trying to convince IS executives that they are as serious and dependable as IBM, but they let it be known at the Unix conference in San Francisco last week that they also know how to have fun.

Sprinkled amid the various displays of so-called industrial-strength hardware and software were comedy acts, magic shows and downright general silliness for the sake of sales.

At WordPerfect's massive display, dozens of show-goers sat happily wearing narrow baseball caps emblazoned with "WordPerfect" as an exceedingly perky young woman ran them through the product pieces. "How did she get them to put on those silly hats?" one passerby wondered aloud.

In the next aisle, Data General required users to wait in line for the chance to enter its booth. Now, was it the deep-dish pizza and the professional magic show? Or the chance to hear a pitch for the new reduced instruction set computing-based Avant! system?

Amidst all the hoopla, put on a set of mini musicals extolling the benefits of Amdash's misaligned computers running the UTS Unix operating system. Titled "The Open Enterprise," the show went on and on — all day long. It featured a man and a woman who burst into joyful song as their imaginary car company's assembly line rolled along.

Users took it all in stride. "I'm here mostly to see what people are giving away. I'm looking for toys," declared Steve Harries, a senior software engineer at Eaton Corp. in Beverly, Mass. About 1,500 bypassed the floor to attend the keynote given by Sun Microsystems CEO Scott McNealy, who joked, "Don't you have any job?"

He then poked fun at alliances of rivals such as IBM and Apple by using a Sun Sparcstation-based demo featuring a mock "reorg tool" that graphically depicted IBM marching on and then digesting the Apple.

Sun disclosed a development alliance of its own with Cray Research, which intends to build high-end Scalable Processor Architecture systems.

MARYFRAN JOHNSON AND JEAN S. BOZMAN



Powering up

IBM's new workstations give the company a price/performance boost in this highly competitive market

| Model/units used | Presentation/220 | Powerserver/320 | Powerserver/560 |
|------------------|------------------|-----------------|-----------------|
| Performance | 33 MHz | 42 MHz | 50 MHz |
| Memory | 25 Spindles | 71.4 Spindles | 97.3 Spindles |
| Disk storage | 144M bytes | 320M bytes | 640M bytes |
| Memory | 1400M bytes | 1400M bytes | 2000M bytes |
| Price | \$7,185 | \$26,790 | \$64,110 |
| Availability | March | February | March |
| Adv. info | See chart | See chart | See chart |

Source: IBM

CWT Chart: JEARL GREENBERG

High Availability-Networ Network File Server, is said to enhance the ability to retrieve data via Sun's Network File System (NFS) from all types of network clients while mirroring NFS on a separate server as a backup.

When it comes to multiprocessor capabilities, however, IBM officials said it will be early 1993 before they can offer clustered multiprocessing in a distributed environment of RS/

open systems. You can move right up if you need to."

The new Presentation and Powerserver models span from a 25-Specmark machine for \$6,345 to an 89-Specmark system priced at \$64,110. The new models represent 30% to 60% price/performance improvements over the current line.

Rather than strip its entry-level model, the 220, of suffi-

Spotlight on commercial Unix

BY MARYFRAN JOHNSON
CWT STAFF

SAN FRANCISCO — Unix's struggle for the kind of legitimacy and acceptance in the commercial world that it has achieved in the scientific and technical one was the underlying theme of the Unixum conference.

"Commercial buyers are definitely here. This move to Unix and open systems is not just hype," he added.

"Unix is bigger, broader and more important in the market place than ever before," Scott McNealy, Sun Microsystems, Inc.'s chief executive officer, said in his keynote address. He went on referring to the progress the environment had made in recent years.

Many of the 40,000 Unixum attendees commented on the sheer number of Unix products demonstrated at the mostly upbeat show that either are available now or will ship in the next 30 days. These included applications development tools, interface development tools and fourth-generation languages.

"Last year, everyone was here to learn the basics, but this year it's a much more sophisticated crowd," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. Users asked tough questions about issues such as computer-aided software engineering frameworks and the standards

needed to get tools to interoperate beyond the operating system into higher level integration concerns, Hurwitz added.

"This has become a very big show," said Michael Goudie, an analyst at Patricia Seybold's Office Computing Group in Boston.

"Commercial buyers are definitely here. This move to Unix and open systems is not just hype," he added.

UniForum

The issues uppermost in users' minds seemed to center on ease of use, system scalability, sufficient security and interoperability between proprietary and open systems environments.

"Unix is trying to be all things to all people now, but it is not as robust as some of the proprietary operating systems," said Brian Anderson, director of information systems at Trans Ocean Ltd. in San Bruno, Calif., a Unisys Corp. Unix user.

Show-goers said they were seeing more examples of tools and utilities, but since they tended to address a couple of specific problems on specific platforms, they did not solve anything for the generic business user.

"We're committed to the best system to solve the problem,"

said David Bond, manager of support services at BP Oil Inc. in Cleveland, which has 50 Digital Equipment Corp. VAX/VMS systems and three Unix systems from DEC, Encore Computer Corp. and Hewlett-Packard Co.

The recent purchase of an HP-Series 800 minisuper Unix system was "the first time we've been able to purchase a system as a turnkey commodity," Bond noted. "The things that our application require the fastest and at the lowest cost."

Like many other commercial customers, BP Oil is concerned about the lack of sufficient operating system scalability for distributed Unix systems. "We will not make any heavy investments in Unix until the security problems are solved," Bond said. In the more secure world of VMS, for example, system managers can tightly control access to individual files — virtually an impossible task in Unix, he added.

Connecting MS-DOS and Unix environments was another topic that piqued a lot of user interest at UniForum.

"I've noticed much more emphasis this year on the X Window environment and graphical user interfaces," said William Raabe, manager, controller and system manager at the Alberta Heart Association in Calgary, Alberta.

Novell covers most Unix bases

BY JIM NASH
CW STAFF

Like beads on a string, Novell, Inc. continues to collect developments and increments with Unix software vendors as part of an effort to provide Netware users with access to every major version of Unix.

"We want to make sure customers [that] use Unix in downgrading strategies are given the maximum number of options," said Kausar Rehki, Novell's executive vice president/general manager of the Interoperability Systems Group.

Novell is working with several partners to deliver on this promise. The allies include The Santa Cruz Operation, which last week licensed Novell's Internet Packet Exchange/Sequence Packet Exchange transport protocol; IBM, which is using Novell software to configure its RISC System/6000 as a Unix server; San Microsystems, Inc., with whom Novell developed a set of Network loadable modules for Network File Services; and Unix System Laboratories, Inc., with whom Novell set up a venture called Univel to develop a Netware version for Unix.

Easier integration

For some network managers already faced with Unix and DOS networks, the accords mean an easier integration of the two. They can now even program products that managers could use to move to Unix systems, according to network administrators.

However, other Novell users considering a Unix migration said they may be able to replace Netware and its Unix extensions with the networking features built into Unix.

Fred Winograd, director of computing planning at Merrill Lynch & Co. in New York, said that once Netware managers, particularly in large companies, begin using Unix at the network level, they may make a wholesale move to Unix.

Ray Chandler, senior network consultant at Arco Oil and Gas Co. in Plano, Texas, concurred. He said Arco "is getting

closer to linking Unix and our PC networks." Currently, the company is using Novell's LAN Workplace for DOS and Netware Network File Services. Chandler said Arco has chosen to bypass Netware for Unix because of its performance.

According to Winograd and others, it is difficult for end users to write their own Netware applications in the form of Netware loadable modules.

However, it is easier to develop client/server applications for Unix, said analyst David Passmore at Ernest & Young in Fairfax, Va., noting that there are more Unix development tools as well.

Also enticing is cosmetic surgery on the Unix interface that will make it easier for the less technically inclined to comprehend. Novell has made friendlier interfaces a priority in its devel-

opment effort toward Unix.

Unix's most notable advantage, according to Robert Cerry, manager of advanced development at Elizay Manufacturing Co. in Oak Brook, Ill., is the sheer number of manufacturing applications available for Unix. Novell's chief drawback is its need for numerous full-time network administrators, he said.

Novell's strategy is to make access between Unix and Netware as easy as possible. However, it is not making connections between the various versions of Unix. "We don't have the resources or the inclination," Rehki said.

If there is any central fixture in this segmented effort, it may be the joint venture, Univel. It is charged with creating a new version of Unix that is optimized to take advantage of Netware features. That software would be a mirror image of Netware for Unix, which is Netware augmented to work on Unix.

Intel eyes chip differentiation

BY MICHAEL FITZGERALD
CW STAFF

SANTA CLARA, Calif. — Intel Corp. said last week it will introduce more than 30 varieties of its 4166 and 80386SL products this year.

That's the goal, according to Thomas Macdonald, marketing manager for the 386 and 486, is to "offer the products our customers want and not leave any available niches or holes for the competition to enter."

Analysts agreed, though, that Intel's main competitor, Advanced Micro Devices, Inc. (AMD), will be "unbeatable."

"There are more opportunities that Intel can tackle," said Erik Janzen, a senior analyst at Alex, Brown & Sons, Inc.'s San Francisco office. Intel will also introduce 3.3 V 386SL and 486SLs this year.

"Intel is going to try to drown them in a tidal wave, but it's not going to work," agreed George Colony, president of market researcher Forrester Research, Inc., in Cambridge, Mass. He

said that the AMD/Intel battle is "absolutely a boon for us. We're looking at 25-MHz 486SLCs for under \$2,000 by the end of the year."

Janzen and the proliferation of chips from Intel and others will "absolutely serve the market. The [traditionally] market doesn't exist anymore" it is now many different markets."

Competing products
AMD said it would announce its plans for the 486 market on Thursday. Chip and Technologies, Inc., which late last year introduced its PC/Chip, a competitor in the 386 market, said it expects to continue providing products that compete with Intel, although it will exit the multi-processing chip business.

Intel, meanwhile, outlined some of its future chip plans last week. The company announced a lower cost version of its 20-MHz 386SL chip that will not support external cache. This chip is in Compaq Computer Corp.'s new LITE Lite 386/20 (see story page 4).

Intel will also introduce its 386SL and 486SLs this year.

"Intel is going to try to drown them in a tidal wave, but it's not going to work," agreed George Colony, president of market researcher Forrester Research, Inc., in Cambridge, Mass. He

Next makes big play for key Intel desktops

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Next, Inc. Chairman Steven Jobs put the high end of the personal computer market squarely in his sights at last week's Nextworld Expo when he announced a new version of the Nextstep operating system that will run on PCs equipped with Intel Corp. i486 microprocessors.

Nextstep 486 will sport the same capabilities as Nextstep 3.0, an updated version of the company's object-oriented operating system that features memory multimedia and sophisticated application development capabilities.

Jobs called the revamped Nextstep 486 the "Trojan horse" that will offer the wide-spread appeal needed to finally get the 7-year-old firm's foot in the door of corporate America. Market researcher Dataquest, Inc. estimated the installed base of 486-based computers to be approximately 2 million.

Next users, however, and they also hope to see an application windfall as a result of Nextstep 486. "Anytime that increases the number of people using Nextstep increases its appeal to developers, and that means more and better applications for me," said Eric Spahr, a vice president

at New York-based Lehman Brothers Division who has equipped his traders with the Nextstation.

Jobs claimed it will not be difficult to port DOS applications over to Nextstep 486, but developers interviewed last week said it was too early to tell. The soft-



Jobs plays Nextstep's envoys in *Fortune 1000*

ware is still in alpha testing.

However, the Redwood City, Calif.-based Next still faces pricing obstacles in selling to PC users.

In addition to shelling out \$995 for the user version of Nextstep 486, a user may need extra circuit boards, additional memory and higher disk drive capacity to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next machine — adding several thousand dollars to the cost of the PC.

DG, HP, D&B pact centers on Unix business programs

BY KIM S. NASH
CW STAFF

FRAMINGHAM, Mass. — In an effort to make their Unix systems more commercially appealing, Data General Corp. and Hewlett-Packard Co. last week disclosed that they are jointly developing business software with Dun & Bradstreet Software.

The trio will co-develop client/server accounting and financial software for the DG Avion and HP 9000 Series 800 lines.

The pact could sway some users to buy Unix machines from DG and HP, especially those still on the fence, concerned about the lack of compatible business software elsewhere. And it will also enable D&B Software to gain two significant platforms for its big push into client/server computing.

"Until this, we were considering Sun only, but now we'll look into DG and HP," said Ed Simons, manager of technology implementation at Enron Corp., a gas pipeline company in

Houston.

Users such as Enron will be able to integrate the new applications with existing mainframe-based D&B Software packages via Unix server software due out this year, according to Bob Camerino, director of client/server strategy at D&B Software.

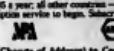
The new products are expected to generate more than \$1 million in 1992 sales for D&B Software. Multiprocessor delivery starts this year.

Enron is putting together a 30-unit ad hoc financial reporting system to run with its existing IBM mainframe-based D&B Software package. The company has already bought a database from Sybase, Inc., to act as the data repository, and it is now looking for Unix servers and workstations to connect to it, according to Camerino.

Such downplaying action is D&B Software, which is reportedly the leading supplier of mainframe applications software, with an installed base of 12,000 sites worldwide.

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APR

TRENDS



E-mail

Getting a recent boost from LANA, E-mail has moved from marginal use to the mainstream market since the early 1980s.

E-mail growth

The popularity of E-mail across private networks is well-illustrated while E-mail traffic on public networks continues to inch along.

U.S. mailbox installed base (in thousands)

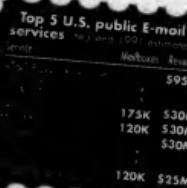


Send me some E-mail!

LAN-based E-mail software is on the rise: 5,400,000 mailboxes were in use at the end of 1991.

DID YOU KNOW?

In 1980, there were only 210,000 installed mailboxes on public networks and 220,000 on private ones, compared to 19.1 million in total now.



Source: Electronic Mail & Micro Systems, New Canaan, Conn.

CW Chart: Jason Gammie

NEXT WEEK

Tough each of the milling machines it builds is unique, Ingersoll Milling Machine is exploiting information technology to streamline its products, says George Hess, vice president of systems and planning. Ingersoll is in the minority, however: Few U.S. companies look to IT to speed product development. See next week's Executive Report.



Smart cards and memory cards, which have about the same dimensions as credit cards, are slowly gaining in popularity. The cards have built-in microprocessors and other circuitry that enable them to be used in a variety of applications, from controlling access to computers to storing vital data. Read about it in Advanced Technology next week.

INSIDE LINES

In play?

► Unisys' return to profitability (see story page 6) may not have been the only force late last week that sent the company's stock surging to more than \$7 a share (a 53-week high). Speculation of an impending \$10.75 per share takeover offer by a heretofore unknown company — HTIC — could well have played a role in the run-up. Sources close to the company say Unisys employees are bracing for a hostile takeover, reminiscent of Burroughs' bearing by Sperry Corp. (which formed Unisys in 1986). Insiders say Charterhouse Bank in the UK, which was said late last year to be organizing an international syndicate to acquire the company, could be behind the HTIC monitor. Unisys Chairman James Unruh declined comment.

Pulling in the horns

► A week after tooting a new "customer-dedicated" reorganization of U.S.-based operations, Bull HN quietly sliced 300 workers from its ranks. The layoffs reportedly touched sales, administration and other positions at company headquarters in Billerica, Mass. No manufacturing or research and development staff lost their jobs, according to a source.

At long last

► More than a year late, DEC will finally release OSI-compatible Decnet for its VMS systems at this week's ComNet. The firm announced Decnet/OSI for Ultrix, but not for VMS, by its original deadline date of September 1990. DEC's Decnet/OSI (formerly named Decnet Phase V) for VMS is said to integrate proprietary Decnet and OSI protocols into one operating system environment. It is slated to ship in June.

Help on the way

► Those trying to choose a network management standard — SNMP, DME or assorted versions of OSI — may soon get some relief. A group of standards organizations that have been working to reach some kind of consensus on a network management standard are due to come out with a position statement at this week's ComNet. Included in the group are Corporation for Open Systems, several ISO bodies, SPARC, X/Open and the OSI Network Management Forum.

Not chopped liver

► While IBM mainframe and DEC VAX platforms are low on Lotus' priority list, Jim Manzi insists the company won't toss them aside. In fact, he said, new releases of 1.2-3 for both platforms will be announced in the first half of 1992. However, he also said that as far as these development efforts go, "There is no consumption of critical resources now. These are small development teams — 10 to 20 people."

TeleSpin control?

► Expect a complete OS/2 2.0 to ship by March's end, according to IBM officials who last week briefed the press during the first of what is bound to be many teleconference OS/2 updates. IBM also said it is making progress with fixes to some minor glitches on the limited-availability version that has been at customer sites for about a month. IBM also promised that beta code for the Windows seamless integration component would go out soon.

Rounding out the line

► Rumors of an impending IBM notebook abode in Europe, where a machine based on IBM's SLC chip is slated to be unveiled at the end of the month. Back in the U.S., although IBM was one of the first to announce an Intel 50-MHz 486-based product, it remains an upgrade board rather than a box. The company will trot out an actual 50-MHz box "when there is enough demand," according to an IBM official. When will that be? "Shortly," the official said.

Doug Michaels, executive vice president of The Santa Cruz Operation, says he finds the reportedly large number of illegal SCOS licenses in Eastern Europe to be kind of a left-handed compliment. "If they had to steal something, we're glad that they stole our software." Have a tip? Call, fax or Computerworld News Editor Alan Alper at (800) 343-6474, (508) 875-8331 or 75537,2413, respectively.

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To thank you for your time in filling out our survey, we'd like to send you a special gift. Featuring the best of our popular weekly cartoon series, "The 5th Wave," this full color calendar will entertain you all year long — and remind you that Computerworld is the most valuable information source in the IS industry.

Please allow 6-8 weeks for delivery.

The 5th Wave



"OOPS - HERE'S THE PROBLEM. SOMETHING'S CAUSING SHORTS
IN THE MAINFRAME."

JANUARY

1992

1992

DECEMBER 1991
S M T W T F S
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
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New Year's Day

New Year's Day

New Year's Day

New Year's Day

9

10

11

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COMPUTERWORLD

A National Survey Of Information Systems Professionals

WE NEED YOUR HELP!

Dear Subscriber:

As part of our ongoing research to learn more about our subscribers, we have attached a survey. If you would take just a few moments to answer the questions on the postage-paid card below and return it to us, we would be most appreciative.

The information you provide will help us in our continuing effort to produce a quality publication for IS professionals.

Thank you,

Gary J. Beach
Publisher

Complete survey
and receive your
FREE
Cartoon Calendar.

Please read before beginning

This questionnaire will only take about ten minutes to complete. Please answer as completely as possible. If you don't know about an exact amount, please respond with your best estimate.

If you prefer to be anonymous, or if you do not have an answer, simply leave the space for that question blank. However, if your actual answer is known, we encourage you to give it rather than make a response.

About Your Organization & IS Personnel Plans

1. What is the range of your IS involvement?

- Entire enterprise at all locations
- Departments and/or divisions at more than one location
- One department and/or division at just one location
- A single department
- Other (please specify) _____

2. For how many locations do you specify, recommend, approve, or influence the purchase of IS products or services?

- 1
- 2 - 5
- 6 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200
- 201 - 500
- 501 - 1,000
- 1,001 - 2,500
- 2,501 - 5,000
- 5,001 - 10,000
- 10,000 or more

3. In the entries below, please indicate how many people:

- Are employed, in total, at the locations(s) you are involved with.
- Are employed at 15 personnel at these locations.

A _____ B _____

For those under 10: 10-151

10 - 24 2

25 - 59 2

60 - 99 1

100 - 249 1

250 - 499 1

500 - 999 1

1,000 - 2,499 1

2,500 - 5,999 1

6,000 or more 1

For the remainder of this survey, "your location(s)" refers to the number of locations you indicated an involvement with in Question 2.

For example, if you indicated involvement with 25 locations, you would answer Question 4 the number of employees at those and only those locations.

4. Do you expect the number of IS personnel to increase, stay the same, or decrease over the next year?

- Increase
- Stay the same
- Decrease

5. What is the total estimated IS spending on hardware, software, networking, and outside contracted services in which you are personally involved for the current period? (Check the box that comes closest)

- Less than \$20,000
- \$20,000 - \$49,999
- \$50,000 - \$1 million
- \$1 million - \$5.9 million
- \$6 million - \$24.9 million
- \$25 million - \$44.9 million
- \$45 million - \$64.9 million
- \$65 million - \$84.9 million
- \$85 million or more

6. How do you expect the spending level above to change in your next budget year?

Increase by ____%. Decrease by ____%.

7. When does your budget year start?

Month ____ Day ____

8. Who do you consider your primary client and who would you expect to be your primary master user from now for each of the product types listed?

Primary Client Primary Future User

PCs Workstations Mainframe Systems

Maintenance Management Applications Software DBMS CASE/Application Development Outside Services

9. For each of the product/service listed below, please check on behalf of your location, the range in the box to the right that includes your best estimate of the amount for the type of product or service currently in use at the location(s) you are involved with.

In Question 9:

Please give your best estimate of how many of each type of product are currently in use at the location(s) you are involved with.

In Question 10:

Please write in the letter next to the range in the box to the right that includes your best estimate of the amount for the type of product or service currently in use at the location(s) you are involved with. Indicate the number of units needed monthly on each product or service.

In Question 11:

Classify if you are involved in recommending, specifying, or influencing the purchase of products/services of this type.

Spending Table

| Range | A | B | C |
|------------------------|---|---|---|
| 1. New | — | — | — |
| 2. Used/Refurbished | — | — | — |
| 3. Maintenance | — | — | — |
| 4. Consulting | — | — | — |
| 5. Training | — | — | — |
| 6. Contract | — | — | — |
| 7. Leasing/Rentals | — | — | — |
| 8. Consulting/Training | — | — | — |
| 9. Contract/Leasing | — | — | — |
| 10. Other | — | — | — |

COMPUTERS

| PCs | A | B | C |
|-------------------|---|---|---|
| Desktop (486) | — | — | — |
| Compaq PCs | — | — | — |
| Macintosh/Laptops | — | — | — |
| Apple Macintosh | — | — | — |
| Other PCs | — | — | — |

| Workstations | A | B | C |
|------------------------|---|---|---|
| RISC-Based | — | — | — |
| Motorola 68000-Based | — | — | — |
| Intel-Based | — | — | — |
| Proprietary Chip-Based | — | — | — |

COMMUNICATING-HARDWARE/MAINFRAME

| Servers | A | B | C |
|----------------------------|---|---|---|
| IBM Mid-range | — | — | — |
| AS/400/Sys 36 | — | — | — |
| VME-based Computers | — | — | — |
| Unisys Mid-range Computers | — | — | — |
| Other Mid-range Computers | — | — | — |
| Networks | — | — | — |
| IBM PC/AT/compatibles | — | — | — |
| Other Microsystems | — | — | — |
| Supersystems/Minicomputers | — | — | — |
| Parallel Processors | — | — | — |

B = In use D = Planned

Y = Yes N = No

U = Unknown

— = Not applicable

0 = None

1 = Low

2 = Moderate

3 = High

4 = Very High

5 = Maximum

6 = Not applicable

7 = None

8 = Low

9 = Moderate

10 = High

11 = Very High

12 = Maximum

13 = Not applicable

14 = None

15 = Low

16 = Moderate

17 = High

18 = Very High

19 = Maximum

20 = Not applicable

21 = None

22 = Low

23 = Moderate

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123 = Very High

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126 = None

127 = Low

128 = Moderate

129 = High

130 = Very High

131 = Maximum

132 = Not applicable

133 = None

134 = Low

135 = Moderate

136 = High

137 = Very High

138 = Maximum

139 = Not applicable

140 = None

141 = Low

142 = Moderate

143 = High

144 = Very High

145 = Maximum

146 = Not applicable

147 = None

148 = Low

149 = Moderate

150 = High

151 = Very High

152 = Maximum

153 = Not applicable

154 = None

155 = Low

156 = Moderate

157 = High

158 = Very High

159 = Maximum

160 = Not applicable

161 = None

162 = Low

163 = Moderate

164 = High

165 = Very High

166 = Maximum

167 = Not applicable

168 = None

169 = Low

1

1 *Check all of the three computer applications listed below; place checkmark or checkmark in box.*

| Check off that apply in next column: | Street Applications | | | Business Range | Industry/Field |
|---|--------------------------|--------------------------|--------------------------|----------------|---------------------|
| | 1 | 2 | 3 | | |
| Business Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1 | Business Management |
| CMS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2 | Business Management |
| Product Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3 | Business Management |
| System Performance Monitoring | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4 | Business Management |
| Utility Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5 | Business Management |
| Network Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6 | Business Management |
| Local Area Network (LAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7 | Business Management |
| Wide Area Network (WAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8 | Business Management |
| Network Configuration/Setup/MPF | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9 | Business Management |
| DATA COMMUNICATIONS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10 | Business Management |
| Telecommunications | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11 | Business Management |
| Network Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12 | Business Management |
| Database Publishing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13 | Business Management |
| Graphics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14 | Business Management |
| Administrative | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 15 | Business Management |
| Accounting/Financial/Postal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 16 | Business Management |
| Data and Marketing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 17 | Business Management |
| Information Systems/Information Systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 18 | Business Management |
| Local Area Network (LAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 19 | Business Management |
| Wide Area Network (WAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 20 | Business Management |
| Network Configuration/Setup/MPF | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 21 | Business Management |
| DATA COMMUNICATIONS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 22 | Business Management |
| Telecommunications | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 23 | Business Management |
| Network Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 24 | Business Management |
| Database Publishing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 25 | Business Management |
| Graphics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 26 | Business Management |
| Administrative | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 27 | Business Management |
| Accounting/Financial/Postal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 28 | Business Management |
| Data and Marketing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 29 | Business Management |
| Information Systems/Information Systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 30 | Business Management |
| Local Area Network (LAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 31 | Business Management |
| Wide Area Network (WAN) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 32 | Business Management |
| Network Configuration/Setup/MPF | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 33 | Business Management |

2 *Select Operating Systems/Environments***1** *Check all that apply in each column:*

| OPERATING SYSTEM | 1 | | | 2 | | |
|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | in use | in use | not in use | in use | not in use | not in use |
| MVS | <input type="checkbox"/> |
| OS/2 | <input type="checkbox"/> |
| VMS | <input type="checkbox"/> |
| DECOS | <input type="checkbox"/> |
| DOS/95 | <input type="checkbox"/> |
| Windows 95 | <input type="checkbox"/> |
| VAX/VMS | <input type="checkbox"/> |
| UNIX | <input type="checkbox"/> |
| PICX | <input type="checkbox"/> |
| Microsoft Windows | <input type="checkbox"/> |
| Macintosh | <input type="checkbox"/> |
| Manager | <input type="checkbox"/> |
| MS-DOS, PC-DOS | <input type="checkbox"/> |
| OS/2, OS/2 Extended Edition | <input type="checkbox"/> |

Tape here for mailing.

Fold here for mailing.

Tape here for mailing.

Fold here for mailing.

BUSINESS REPLY MAIL

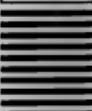
FIRST CLASS MAIL PERMIT NO. 875 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

ATTN: Joanne Otar
 Info Services Dept.; 5 Speen Street
 P.O. Box 9204
 Framingham, MA 01701-9871

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



4 Which of the following best describes your organization's primary business or industry?

1 What is the name of your parent company?

2 Are you at the sole location of your company/organization?

Yes No

3 What is your title/function? (Check only one)

- Sales/Management
- Chief Information Officer, Vice President, Assistant VP, IS/AM/DP Manager
- Director/Manager MIS Services, Information Center
- Director/Manager Tech Planning, Administrative Services, Data Processing, MIS, Computer Systems Management, Director/Manager PC Resources
- Director/Manager Systems Development, Systems Architecture
- Manager/Superintendent of Programming, Software
- Programmer, Software Developer
- Systems Integrator, VARs, Consulting Management

Other Company Management

- President, Owner, Partner, General Manager
- Vice President, Assistant VP
- Director, Controller, Financial Officer
- Engineering, Scientific, R&D, Tech
- Sales & Marketing Management

Other Professionals

- Medical, Legal, Accounting Management
- Educator, Journalist, Librarian, Student
- Other (Please specify)

5a Is label address correct or incorrect? If not, please retype in space below.

5b Is label address a home or business?

Home Business

5c Please provide information below, if and as label. (THIS WILL NOT AFFECT DELIVERY OF THIS MAILING).

Name/Title _____

Company _____

Company Address _____

City/City/Zip _____

Comments _____

Thank you for your participation in this study.

Please fold and fasten your survey form closed so return address shows and drop it in the mail.